

Baltic Grid Certification Authority

# Certificate Policy and Certification Practice Statement

Version 1.1

Document OID: 1.3.6.1.4.1.19974.11.1.1.1

January 2006

## Table of Contents

1. INTRODUCTION.....	6
1.1 Overview.....	6
1.2 Identification.....	6
1.3 Community and Applicability.....	6
1.3.1 Certification authorities.....	6
1.3.2 Registration authorities.....	6
1.3.3 End entities.....	7
1.3.4 Applicability.....	7
1.4 Contact Details.....	7
1.4.1 Specification administration organization.....	7
1.4.2 Contact person.....	7
1.4.3 Person determining CPS suitability for the policy.....	8
2. GENERAL PROVISIONS.....	9
2.1 Obligations.....	9
2.1.1 BGCA obligations.....	9
2.1.2 RA obligations.....	9
2.1.3 Subscriber obligations.....	10
2.1.4 Relying party obligations.....	10
2.1.5 Repository obligations.....	10
2.2 Liability.....	11
2.3 Financial responsibility.....	11
2.4 Interpretation and Enforcement.....	11
2.4.1 Governing law.....	11
2.4.2 Severability, survival, merger, notice.....	11
2.4.3 Dispute resolution procedures.....	11
2.5 Fees.....	11
2.6 Publication and Repository.....	12
2.6.1 Publication of CA information.....	12
2.6.2 Frequency of publication.....	12
2.6.3 Access controls.....	12
2.7 Compliance audit.....	12
2.8 Confidentiality.....	12
2.8.1 Types of information to be kept confidential.....	12
2.8.2 Types of information not considered confidential.....	12
2.8.3 Disclosure of certificate revocation/suspension information.....	13
2.8.4 Release to law enforcement officials.....	13
2.8.5 Release as part of civil discovery.....	13
2.8.6 Disclosure upon owner's request.....	13
2.8.7 Other information release circumstances.....	13
2.9 Intellectual Property Rights.....	13
3. IDENTIFICATION AND AUTHENTICATION.....	14
3.1 Initial Registration.....	14
3.1.1 Types of names.....	14
3.1.2 Need for names to be meaningful.....	14
3.1.3 Rules for interpreting various name forms.....	15
3.1.4 Uniqueness of names.....	15

- 3.1.5 Name claim dispute resolution procedure..... 15
- 3.1.6 Recognition, authentication and role of trademarks..... 16
- 3.1.7 Method to prove possession of private key..... 16
- 3.1.8 Authentication of organization identity..... 16
- 3.1.9 Authentication of individual identity ..... 16
- 3.2 Routine Rekey..... 17
- 3.3 Rekey after Revocation..... 17
- 3.4 Revocation Request..... 17
- 4. OPERATIONAL REQUIREMENTS..... 18
  - 4.1 Certificate Application..... 18
  - 4.2 Certificate Issuance..... 18
  - 4.3 Certificate Acceptance..... 18
  - 4.4 Certificate Suspension and Revocation..... 18
    - 4.4.1 Circumstances for revocation..... 18
    - 4.4.2 Who can request revocation..... 18
    - 4.4.3 Procedure for revocation request..... 19
    - 4.4.4 Revocation request grace period..... 19
    - 4.4.5 Circumstances for suspension..... 19
    - 4.4.6 Who can request suspension..... 19
    - 4.4.7 Procedure for suspension request..... 19
    - 4.4.8 Limits on suspension period..... 19
    - 4.4.9 CRL issuance frequency (if applicable)..... 19
    - 4.4.10 CRL checking requirements..... 19
    - 4.4.11 On-line revocation/status checking availability..... 19
    - 4.4.12 On-line revocation checking requirements..... 20
    - 4.4.13 Other forms of revocation advertisements available..... 20
    - 4.4.14 Checking requirements for other forms of revocation advertisements..... 20
    - 4.4.15 Special requirements re key compromise..... 20
  - 4.5 Security Audit Procedures..... 20
    - 4.5.1 Types of event recorded..... 20
    - 4.5.2 Frequency of processing log..... 20
    - 4.5.3 Retention period for audit log..... 20
    - 4.5.4 Protection of audit log..... 20
    - 4.5.5 Audit log backup procedures..... 20
    - 4.5.6 Audit collection system (internal vs external)..... 21
    - 4.5.7 Notification to event-causing subject..... 21
    - 4.5.8 Vulnerability assessments..... 21
  - 4.6 Records Archival..... 21
    - 4.6.1 Types of events recorded..... 21
    - 4.6.2 Retention period for archive..... 21
    - 4.6.3 Protection of archive..... 21
    - 4.6.4 Archive backup procedures..... 21
    - 4.6.5 Requirements for time-stamping of records..... 21
    - 4.6.6 Archive collection system (internal or external)..... 21
    - 4.6.7 Procedures to obtain and verify archive information..... 21
  - 4.7 Key changeover..... 22
  - 4.8 Compromise and Disaster Recovery..... 22
    - 4.8.1 Computing resources, software, and/or data are corrupted..... 22
    - 4.8.2 Entity public key is revoked..... 22

- 4.8.3 Entity key is compromised..... 22
- 4.8.4 Secure facility after a natural or other type of disaster..... 22
- 4.9 CA Termination..... 23
- 5. PHYSICAL, PROCEDURAL, AND PERSONNEL SECURITY CONTROLS..... 24
  - 5.1 Physical Controls..... 24
    - 5.1.1 Site location and construction..... 24
    - 5.1.2 Physical access..... 24
    - 5.1.3 Power and air conditioning..... 24
    - 5.1.4 Water exposures..... 24
    - 5.1.5 Fire prevention and protection..... 24
    - 5.1.6 Media storage..... 24
    - 5.1.7 Waste disposal..... 24
    - 5.1.8 Off-site backup..... 24
  - 5.2 Procedural Controls..... 24
    - 5.2.1 Trusted roles..... 24
    - 5.2.2 Number of persons required per task..... 25
    - 5.2.3 Identification and authentication for each role..... 25
  - 5.3 Personnel Controls..... 25
    - 5.3.1 Background, qualifications, experience, and clearance requirements..... 25
    - 5.3.2 Background check procedures..... 25
    - 5.3.3 Training requirements..... 25
    - 5.3.4 Retraining frequency and requirements..... 25
    - 5.3.5 Job rotation frequency and sequence..... 25
    - 5.3.6 Sanctions for unauthorized actions..... 25
    - 5.3.7 Contracting personnel requirements..... 25
    - 5.3.8 Documentation supplied to personnel..... 25
- 6. TECHNICAL SECURITY CONTROLS..... 26
  - 6.1 Key Pair Generation and Installation..... 26
    - 6.1.1 Key pair generation..... 26
    - 6.1.2 Private key delivery to entity..... 26
    - 6.1.3 Public key delivery to certificate issuer..... 26
    - 6.1.4 CA public key delivery to users..... 26
    - 6.1.5 Key sizes..... 26
    - 6.1.6 Public key parameters generation..... 26
    - 6.1.7 Parameter quality checking..... 26
    - 6.1.8 Hardware/software key generation..... 26
    - 6.1.9 Key usage purposes (as per X.509 v3 key usage field)..... 27
  - 6.2 Private Key Protection..... 27
    - 6.2.1 Standards for cryptographic module..... 27
    - 6.2.2 Private key (n out of m) multi-person control..... 27
    - 6.2.3 Private key escrow..... 27
    - 6.2.4 Private key backup..... 27
    - 6.2.5 Private key archival..... 27
    - 6.2.6 Private key entry into cryptographic module ..... 27
    - 6.2.7 Method of activating private key ..... 27
    - 6.2.8 Method of deactivating private key ..... 27
    - 6.2.9 Method of destroying private key ..... 28
  - 6.3 Other Aspects of Key Pair Management..... 28
  - 6.4 Activation Data..... 28

- 6.4.1 Activation data generation and installation.....28
- 6.4.2 Activation data protection.....28
- 6.4.3 Other aspects of activation data.....28
- 6.5 Computer Security Controls.....28
  - 6.5.1 Specific computer security technical requirements.....28
  - 6.5.2 Computer security rating.....28
- 6.6 Life Cycle Technical Controls.....29
  - 6.6.1 System development controls.....29
  - 6.6.2 Security management controls.....29
  - 6.6.3 Life cycle security ratings.....29
- 6.7 Network Security Controls.....29
- 6.8 Cryptographic Module Engineering Controls.....29
- 7. CERTIFICATE AND CRL PROFILES.....30
  - 7.1 Certificate Profile.....30
    - 7.1.1 Version number.....30
    - 7.1.2 Certificate extensions.....30
    - 7.1.3 Algorithm object identifiers.....31
    - 7.1.4 Name forms.....31
    - 7.1.5 Name constraints.....31
    - 7.1.6 Certificate policy Object Identifier.....31
    - 7.1.7 Usage of Policy Constraints extension.....31
    - 7.1.8 Policy qualifiers syntax and semantics.....31
    - 7.1.9 Processing semantics for the critical certificate policy extension.....31
  - 7.2 CRL Profile.....31
    - 7.2.1 Version number.....31
- 8. SPECIFICATION ADMINISTRATION.....32
  - 8.1 Specification change procedures.....32
  - 8.2 Publication and notification policies.....32
  - 8.3 CPS approval procedures.....32
- APPENDIX 1: Glossary.....33
- APPENDIX 2: Key words for use in RFCs to Indicate Requirement Levels.....35
- REFERENCES.....36

# 1. INTRODUCTION

## 1.1 Overview

The Baltic Grid project is aimed at administering, coordinating and developing Grid resources in the Baltic States, i.e. in the Republics of Estonia, Latvia and Lithuania.

Estonian Educational and Research Network (EENet) is a governmental nonprofit organization with the task of managing, coordinating and developing the computer network of science, education and culture in Estonia.

The scope of the Baltic Grid Certification Authority is to provide PKI services for grid initiatives in the Baltic States.

EENet manages, coordinates and develops the Baltic Grid Certification Authority (BGCA).

This document is the combined Certificate Policy and Certification Practice Statement of the BGCA. It describes the set of procedures followed by the BGCA and is structured according to RFC 2527. The latter does not form part of this document and only the information provided in this document may be relied on.

## 1.2 Identification

1. Document title: "Baltic Grid Certification Authority Certificate Policy and Certification Practice Statement"
2. Version: 1.1.
3. Document Date: 10.01.2006
4. OID: 1.3.6.1.4.1.19974.11.1.1.1

IANA	1.3.6.1.4.1
EENet	.19974
BGCA	.11
CP/CPS	.1
Major Version	.1
Minor Version	.1

5. Expiration: This document is valid until further notice.

## 1.3 Community and Applicability

### 1.3.1 Certification authorities

The BGCA is defined as a medium security CA. BGCA does not issue certificates to subordinate certification authorities.

### 1.3.2 Registration authorities

The BGCA manages the functions of its Registration Authority (RA). Additional RAs SHOULD

be created in every Baltic State.

### **1.3.3 End entities**

The BGCA issues certificates to natural persons, computer and service entities. The entities eligible for certification from the BGCA are all those related to organizations, formally based in and/or having offices in Estonia, Latvia or Lithuania, that are involved in research or deployment of multidomain distributed computing infrastructure, intended for cross-organizational sharing of resources. The focus of these organizations SHOULD also be in research and/or education.

### **1.3.4 Applicability**

There will be three categories of certificates:

1. Server certificates: authentication, non-repudiation and communication encryption;
2. User certificates: authentication, non-repudiation, data encryption and communication encryption.
3. Services certificates: authentication, non-repudiation, data encryption and communication encryption.

The ownership of a BGCA certificate does not imply automatic access to any kind of resources.

Certificates issued by BGCA MUST NOT be used for financial transactions.

## **1.4 Contact Details**

### **1.4.1 Specification administration organization**

The BGCA is created and managed by the Estonian Educational and Research Network.

The BGCA address for operational issues is:

Baltic Grid Certification Authority  
Estonian Educational and Research Network  
Raekoja plats 14  
Tartu 51004  
Estonia  
Tel: +372 730 2110  
Fax: +372 730 2111  
Email: [ca@ca.balticgrid.org](mailto:ca@ca.balticgrid.org)

### **1.4.2 Contact person**

Lauri Anton  
Estonian Educational and Research Network

Baltic Grid Certification Authority CP and CPS

Raekoja plats 14

Tartu 51004

Estonia

Tel: +372 730 2110

Fax: +372 730 2111

Email: lauri.anton@eenet.ee

### **1.4.3 Person determining CPS suitability for the policy**

See Section 1.4.2



## 2. GENERAL PROVISIONS

### 2.1 Obligations

#### 2.1.1 BGCA obligations

The BGCA is responsible for all aspects of the issuance and management of a certificate referencing this policy, including:

1. Development of a detailed statement of practices and procedures (the CPS) by which the BGCA implements the requirements of this policy;
2. Publication of BGCA contact information;
3. Certificate application/enrollment process;
4. Verification of the identity of the applicant;
5. Certificate signing process;
6. Posting of the signed certificate in a public repository;
7. Revocation of the certificate;
8. Certificate renewals;
9. Issuing and publishing certificate revocation lists;
10. Ensuring that all aspects of the CA services and CA operations and CA infrastructure related to certificates issued under this policy are performed in accordance with the requirements, representations, and warranties of this policy;
11. Define and publish a dispute resolution procedure.

By issuing a certificate that references this policy, the CA certifies to the subscriber, and to all relying parties who reasonably and in good faith rely on the information contained in the certificate during its operational period, that:

1. The CA has issued, and will manage, the certificate in accordance with this policy.
2. There are no misrepresentations of fact in the certificate known to the CA, and the CA has taken reasonable steps to verify additional information in the certificate unless otherwise noted in its CPS.
3. The certificate meets all requirements of this policy and the CA's CPS.

#### 2.1.2 RA obligations

The RA is responsible for the following aspects:

1. authenticate entities requesting a certificate according to the procedures described in this document;
2. send validated certificate requests to BGCA;
3. create and send validated revocation requests to the BGCA;

4. communicate with BGCA using secure channels and methods;
5. follow the policies and procedures described in this document;

### **2.1.3 Subscriber obligations**

In all cases, the BGCA SHALL require that:

1. Subscribers MUST accurately represent the information required from them in a certificate request. The requirements are detailed in 3.1.1 and 3.1.2.
2. Subscribers MUST properly protect their private key at all times, against loss, disclosure to any other party, modification and unauthorized use, in accordance with this CP /CPS. From the creation of their private and public key pair, subscribers are personally and solely responsible of the confidentiality and integrity of their private keys. Every usage of their private key is assumed to be the act of its owner. The private key MUST NOT be shared to other parties.
3. Upon suspicion that their private keys are compromised subscribers MUST notify the CA that issued their certificates by sending a certificate revocation request.
4. Upon any change of information in their certificates subscribers MUST notify the CA that issued their certificates by sending a certificate revocation request.
5. Subscribers MUST use the keys and certificates only for the purposes authorized by the CA.
6. On submitting the certificate requests, subscribers MUST authorize the treatment and conservation of their personal data.
7. The passphrase used for protection of subscribers private key MUST be at least 12 characters long.

### **2.1.4 Relying party obligations**

A relying party MUST be familiar with the this CP/CPS before drawing any conclusion on how much trust it can put in the use of a certificate issued by the CA.

The relying party MUST only use the certificate for the prescribed applications and MUST NOT use the certificates for forbidden applications.

Relying parties MUST verify the digital signature of a received digitally signed message and to verify the digital signature of the CA who issued the certificate used for the verification purpose.

When validating a certificate a relying party SHOULD check it for its validity, revocation, or suspension.

### **2.1.5 Repository obligations**

BGCA is responsible for providing a public repository, accessible through the World Wide Web at <http://ca.balticgrid.org/>.

1. BGCA will publish its public key on the above website;

2. BGCA will publish the CRLs on the abovementioned website as soon as they are issued.

## **2.2 Liability**

1. BGCA guarantees to control the identity of the certification requests according to the procedures described in this document;
2. BGCA guarantees to control the identity of the revocation requests according to the procedures described in this document;
3. BGCA is managed on a best effort basis and does not give any guarantees about the service security or suitability;
4. BGCA SHALL NOT be held liable for any problems arising from its operations or improper use of the issued certificates or CRLs;
5. BGCA denies any kind of responsibilities for damages or impairments resulting from its operation.

## **2.3 Financial responsibility**

BGCA denies any financial responsibilities for damages or impairments resulting from its operation.

## **2.4 Interpretation and Enforcement**

### **2.4.1 Governing law**

The enforceability, construction, interpretation and validity of this policy shall be governed by the Laws of the Republic of Estonia. Legal disputes arising from the operation of the BGCA will be treated according to Estonian laws, legal disputes arising from the operation of the RAs will be treated according to the laws of their country of residence.

### **2.4.2 Severability, survival, merger, notice**

No stipulation.

### **2.4.3 Dispute resolution procedures**

No stipulation.

## **2.5 Fees**

Fees SHALL NOT be charged.

## **2.6 Publication and Repository**

### **2.6.1 Publication of CA information**

The BGCA is obligated to maintain a secure on-line repository that is available through a web interface at <http://ca.balticgrid.org/> and it contains:

1. the BGCA certificate for its signing key;
2. the latest CRL;
3. a copy of this document which specifies the CP and CPS;
4. other relevant information relating to certificates that refer to this Policy.

### **2.6.2 Frequency of publication**

All information to be published in the repository SHALL be published promptly after such information is available to the CA. CRLs issued by BGCA are renewed whenever any certificate is revoked, and at least 7 days before expiration of the previously issued CRL.

### **2.6.3 Access controls**

BGCA does not impose any access control restrictions to the information available at its web site, which includes the CA certificate, latest CRL and a copy of this document containing the CP and CPS. BGCA may impose a more restricted access control policy to the repository at its discretion. The BGCA web site is maintained on a best effort basis. Excluding maintenance shutdowns and unforeseen failures the site SHOULD be available at all times.

## **2.7 Compliance audit**

The BGCA may be audited by members of EUGridPMA and other Relaying Parties to verify its compliance with the rules and procedures specified in this document. Any costs associated with such an audit MUST be covered by the requesting party.

## **2.8 Confidentiality**

### **2.8.1 Types of information to be kept confidential**

All subscribers' information that is not present in the certificate and CRLs issued by BGCA is considered confidential and SHALL NOT be released to third parties without explicit subscriber's authorization except as described in 2.8.4.

### **2.8.2 Types of information not considered confidential**

Information included in public certificates and CRLs issued by the BGCA are not considered confidential.

### **2.8.3 Disclosure of certificate revocation/suspension information**

When a certificate is revoked/suspended, a reason code is not considered confidential and MAY be shared with all other users and relying parties. However, no other details concerning the revocation are normally disclosed.

### **2.8.4 Release to law enforcement officials**

BGCA MUST NOT disclose confidential information to any third party, except when required by law enforcement officials that exhibit regular warrant.

### **2.8.5 Release as part of civil discovery**

No stipulation.

### **2.8.6 Disclosure upon owner's request**

The CA SHALL release information if authorized by the subscriber.

### **2.8.7 Other information release circumstances**

No stipulation.

## **2.9 Intellectual Property Rights**

No stipulation.

## 3. IDENTIFICATION AND AUTHENTICATION

### 3.1 Initial Registration

#### 3.1.1 Types of names

The subject names for the certificate applicants SHALL follow the X.509 standard. Any name under this CP/CPS starts with DC=org, DC=balticgrid .

1. In case of **personal** certificate:
  - Common Name MUST include the person's full name.
  - Organizational Unit MUST include the organization domain name.
2. In case of **server** certificate
  - Common Name MUST include the "host/" prefix, followed by the server DNS name (FQDN).
  - Organizational Unit MUST include the organization domain name.
3. In case of **grid service** certificate
  - Common Name MUST include the "servicename/" prefix, followed by the server DNS name (FQDN).
  - Organizational Unit MUST include the organization domain name.

#### 3.1.2 Need for names to be meaningful

The Subject and Issuer names contained in a certificate MUST be meaningful in the sense that the issuing CA has proper evidence of the existent association between these names and the entities to which they belong.

For personal certificates, the Common Name attribute contains the legal name as presented in a government issued photo-identification.

If the legal name includes letters which are not present among letters present in PrintableString as defined in RFC1778, then those letters MUST be substituted with PrintableString letters according to following conversion table:

Non-PrintableString letters	PrintableString letters
ä	a
õ	o
ö	o
ü	u
ā	a
ą	a
č	c
ē	e
è	e
ę	e
ġ	g
ī	i
ì	i
ķ	k
ļ	l
ņ	n
ŗ	r
š	s
ū	u
ų	u
ž	z

For server certificates, the CN DN attribute contains the fully qualified domain name of the server.

For service certificates, the CN MUST be related to the type of service the certificate is identifying.

### 3.1.3 Rules for interpreting various name forms

See Section 3.1.1 and Section 3.1.2.

### 3.1.4 Uniqueness of names

The *Common Name* MUST be unique for each subject entity certified by the BGCA. In case of name collision when more than one person uses the same name, a number is appended to the *Common Name* to make the name unique.

### 3.1.5 Name claim dispute resolution procedure

No stipulation.

### **3.1.6 Recognition, authentication and role of trademarks**

No stipulation.

### **3.1.7 Method to prove possession of private key**

No stipulation.

### **3.1.8 Authentication of organization identity**

RA MUST verify the authentication of organization by checking if:

1. The organization is known to be part of a grid-computing project or related partner.
2. The organization is registered and operate in one of the Baltic States. Registration will be validated through proper public authorities.

The person who issues a request MUST demonstrate the relation between him/her and the organization he/she represents.

### **3.1.9 Authentication of individual identity**

1. Person requesting a certificate:
  - A request sent to RA SHALL be considered authenticated when it is cryptographically signed by requestors valid national ID-card certificate or by valid certificate issued for the requestor by the BGCA.
  - Otherwise, a user requesting a certificate MUST meet in person with the RA and show his/her personal photo-id (passport, national ID-card or national Driver License). If the photo-id is valid and the photo image corresponds to the bearer, the RA SHALL consider the user correctly identified.  
The certificate request must be delivered to RA.
2. Server or service certificate:
  - Requests MUST be signed by the personal certificate of the corresponding system administrator issued by BGCA or by national ID-card certificate.
3. Person not requesting a certificate (revocation):
  - Individual identity may be authenticated by personal acquaintance with RA staff;
  - By physical presence and proof of identity through a photo-id (passport, national ID-card or national Driver License);
  - By consulting a public directory and verifying whether the person made the request.

RA SHALL send authenticated requests to the BGCA. Any information exchanged between the requestor, the RA and the CA shall be either signed by strong cryptographic means, or shall be verified by out-of-band methods in a phone conversation with firm positive identification by parties involved.



## **3.2 Routine Rekey**

Expiration warnings will be issued to subscribers when rekey time arrives. Rekey before expiration can be accomplished by sending a rekey request signed with the current user certificate. Rekey after expiration follows the same authentication procedure as new certificate.

## **3.3 Rekey after Revocation**

Rekey after revocation follows the same rules as an initial registration.

## **3.4 Revocation Request**

A proper authentication method is required in order to accept revocation request. BGCA MUST accept as a revocation request a message digitally signed with a not expired and not previously revoked certificate issued under this policy. The same procedures adopted for the authentication during initial registration are also considered suitable.

## **4. OPERATIONAL REQUIREMENTS**

### **4.1 Certificate Application**

The necessary provisions that **MUST** be followed in any certificate application request to the BGCA are:

1. the subject **MUST** be an acceptable end user entity, as defined by this Policy;
2. the request **MUST** obey the BGCA distinguished name scheme;
3. the distinguished name **MUST** be unambiguous and unique;
4. the key **MUST** have at least 1024 bits.

### **4.2 Certificate Issuance**

The following requirements **MUST** be met for a certificate to be issued:

1. the subject authentication **MUST** be successful;
2. the maximum validity period for a certificate **MUST** be 1 year.

The subject will be notified by E-mail about the certificate issuance or rejection. In the case of rejection the E-mail will state the reason.

### **4.3 Certificate Acceptance**

The certificate is assumed to be accepted unless its requester explicitly rejects it in an authenticated communication with the CA.

### **4.4 Certificate Suspension and Revocation**

#### **4.4.1 Circumstances for revocation**

A certificate will be revoked when the information in the certificate is known to be suspected or compromised or at the request of the authorized entity. It includes following situations:

1. The associated private key is known to be compromised or misused.
2. The associated private key is suspected to be compromised or misused.
3. The subscriber's information in the certificate has changed.
4. The subscriber is known to have violated his obligations.
5. The authenticated requester requested the certificate revocation.

#### **4.4.2 Who can request revocation**

A certificate revocation can be requested by the holder of the certificate to be revoked or by any other entity presenting proof of knowledge of the private key compromise or of the variation of the subscriber's data.

#### **4.4.3 Procedure for revocation request**

In case where the CA can independently confirm that the certificate has been compromised or misused, the CA SHALL revoke the certificate, even if the request to do so comes from an unauthenticated source and/or the holder of the certificate is unreachable.

In all other cases the CA SHALL authenticate the revocation request and try to contact the subscriber before revoking the certificate.

If the revoked certificate is the CA certificate then the CA SHALL in addition inform the subscribers and cross-certifying CAs and it SHALL terminate the certificate and CRLs distribution service for certificates/CRLs issued using the compromised private key.

#### **4.4.4 Revocation request grace period**

The BGCA has a maximum response time of one day (excluding weekends and public holidays in Estonia) for revocations; it will however handle revocation requests with priority as soon as the request is recognised as such.

#### **4.4.5 Circumstances for suspension**

No stipulation.

#### **4.4.6 Who can request suspension**

No stipulation.

#### **4.4.7 Procedure for suspension request**

No stipulation.

#### **4.4.8 Limits on suspension period**

No stipulation.

#### **4.4.9 CRL issuance frequency (if applicable)**

CRLs issued by BGCA are renewed whenever any certificate is revoked, and at least 7 days before expiration of the previously issued CRL. The maximum CRL lifetime MUST be at most 30 days.

#### **4.4.10 CRL checking requirements**

Before use of a certificate, a relying party SHOULD validate it against a recently issued CRL.

#### **4.4.11 On-line revocation/status checking availability**

The on-line revocation/status checking service is not currently available.

#### **4.4.12 On-line revocation checking requirements**

No stipulation.

#### **4.4.13 Other forms of revocation advertisements available**

The subscriber is notified of the revocation of his certificate by email.

#### **4.4.14 Checking requirements for other forms of revocation advertisements**

No stipulation.

#### **4.4.15 Special requirements re key compromise**

No stipulation.

### **4.5 Security Audit Procedures**

#### **4.5.1 Types of event recorded**

1. Boot and shutdown of CA machine;
2. Interactive system logins;
3. Certification requests;
4. Revocation requests;
5. Issued certificates;
6. Issued CRLs.

#### **4.5.2 Frequency of processing log**

No stipulation.

#### **4.5.3 Retention period for audit log**

Logs will be kept for a minimum of three years. After termination of BGCA or a RA, the logs will be kept for a minimum of three years by BGCAs host organization.

#### **4.5.4 Protection of audit log**

Audit logs may be consulted by:

1. CA personnel;
2. Authorized external auditors.

#### **4.5.5 Audit log backup procedures**

No stipulation.

#### **4.5.6 Audit collection system (internal vs external)**

No stipulation.

#### **4.5.7 Notification to event-causing subject**

No stipulation.

#### **4.5.8 Vulnerability assessments**

No stipulation.

### **4.6 Records Archival**

#### **4.6.1 Types of events recorded**

The following events are recorded and archived:

1. certificate requests
2. approved certificate requests
3. issued certificates
4. CRLs

#### **4.6.2 Retention period for archive**

The minimum retention period is three years. After termination of BGCA or a RA, the archive will be kept for a minimum of three years by BGCAs host organization.

#### **4.6.3 Protection of archive**

Records are backed up on removable media, which are stored in a room with restricted access.

#### **4.6.4 Archive backup procedures**

See section 4.6.3.

#### **4.6.5 Requirements for time-stamping of records**

No stipulation.

#### **4.6.6 Archive collection system (internal or external)**

The archive collection system is internal to the BGCA.

#### **4.6.7 Procedures to obtain and verify archive information**

No stipulation.

## 4.7 Key changeover

CA's private signing key is changed periodically. To avoid interruption of validity of all subordinate keys the new CA key is generated one year before the old one loses validity and, from that point onwards, new certificates are signed with the new key. The new key is posted in the repository.

## 4.8 Compromise and Disaster Recovery

If the private key of the BGCA is compromised or suspected to be compromised, the BGCA will:

1. inform subscribers, relevant relying parties and all cross-certifying CAs,
2. terminate the certificate and CRL distribution for the certificates or CRL's issued using the compromised private key.

If a RA's private key is compromised or suspected to be compromised, the RA shall inform the BGCA and request revocation of the RA's certificate. If an entity's private key is compromised or suspected to be compromised, the entity or its administrator or responsible person MUST request revocation of the certificate and inform any relevant relying parties.

### 4.8.1 Computing resources, software, and/or data are corrupted

The private keys of the BGCA are only available in encrypted form on media stored in a secure location. The computer used to activate the private key is not accessible via any network. If the computer and/or the media are lost, this will be handled as a major compromise that implies generating a new key pair and terminating all services associated with the lost key pair.

If the hardware or software of the CA signing computer become corrupt, the status will be diagnosed and suitably repaired. If there is any doubt about the extent of the damage involved, this will imply rebuilding the machine from scratch, using original supplied parts and software distributions.

If data becomes corrupted, the cause will be diagnosed and the data restored from the latest back-up.

### 4.8.2 Entity public key is revoked

See section 4.8.

### 4.8.3 Entity key is compromised

See section 4.8.

### 4.8.4 Secure facility after a natural or other type of disaster

In case of (natural) disaster, the BGCA administrator(s) will as soon as physically possible confirm that all CA activation materials are at the intended locations. Depending on the situation, disaster recovery will start.

## **4.9 CA Termination**

Before the BGCA terminates its services, the BGCA shall:

1. make all reasonable efforts to inform subscribers, RAs and cross-certifying CAs
2. make knowledge of its termination widely available
3. cease issuing certificates and CRLs
4. destroy all copies of private keys

## **5. PHYSICAL, PROCEDURAL, AND PERSONNEL SECURITY CONTROLS**

### **5.1 Physical Controls**

#### **5.1.1 Site location and construction**

The BGCA is located at the EENet office.

#### **5.1.2 Physical access**

Physical access to the BGCA is restricted to authorized personnel of the BGCA.

#### **5.1.3 Power and air conditioning**

The critical BGCA equipment is connected to uninterrupted power supply units.

#### **5.1.4 Water exposures**

The BGCA secure operating room is located on the first floor of the building. No floods are expected.

#### **5.1.5 Fire prevention and protection**

The BGCA secure operating room is provided with smoke detectors.

#### **5.1.6 Media storage**

1. The BGCA key is kept in several removable storage media;
2. Backup copies of CA related information are kept in USB storage devices and on CDROMs.

#### **5.1.7 Waste disposal**

All BGCA paper waste MUST be shredded. Electronic media MUST be physically/mechanically destroyed before disposal.

#### **5.1.8 Off-site backup**

No off-site backups are currently performed.

### **5.2 Procedural Controls**

#### **5.2.1 Trusted roles**

No stipulation.



### **5.2.2 Number of persons required per task**

There is no requirement within the BGCA to act within any role in the presence of more than one person.

### **5.2.3 Identification and authentication for each role**

No stipulation.

## **5.3 Personnel Controls**

### **5.3.1 Background, qualifications, experience, and clearance requirements**

The role of the CA requires a suitably trained person that is familiar with the importance of a PKI, and who is technically and professionally competent. There are no background checks of clearance procedures for trusted or other roles.

### **5.3.2 Background check procedures**

No stipulation.

### **5.3.3 Training requirements**

Internal training is given to CA and RA operators.

### **5.3.4 Retraining frequency and requirements**

No stipulation.

### **5.3.5 Job rotation frequency and sequence**

No stipulation.

### **5.3.6 Sanctions for unauthorized actions**

No stipulation.

### **5.3.7 Contracting personnel requirements**

No stipulation.

### **5.3.8 Documentation supplied to personnel**

Copies of this document MUST be given to personnel of CA and RAs.

## **6. TECHNICAL SECURITY CONTROLS**

### **6.1 Key Pair Generation and Installation**

#### **6.1.1 Key pair generation**

Key pairs for the BGCA are generated exclusively by authorized BGCA personnel acting in the role of CA.

End entities' key pairs are always generated by their application during the requesting process. They are never generated or stored by the BGCA.

#### **6.1.2 Private key delivery to entity**

Private keys are never delivered. End entities are required to generate their own key pairs.

#### **6.1.3 Public key delivery to certificate issuer**

1. The entity **MUST** submit a certificate request with the public key according to the requirements detailed in section 4.1.
2. The entity **MUST** be authenticated according to the procedures described in 3.1.9 and 3.1.8.
3. The entity **SHOULD** submit a cryptographically signed certification request via e-mail to [ca@ca.balticgrid.org](mailto:ca@ca.balticgrid.org) or **SHOULD** deliver a certification request to the RA during face-to-face meeting.

#### **6.1.4 CA public key delivery to users**

The CA's root certificate can be downloaded from BGCA website.

#### **6.1.5 Key sizes**

The RSA key length for the BGCA is 2048 bits. Keys submitted for certification **MUST** be at least 1024 bits.

#### **6.1.6 Public key parameters generation**

No stipulation.

#### **6.1.7 Parameter quality checking**

No stipulation.

#### **6.1.8 Hardware/software key generation**

No stipulation.

### **6.1.9 Key usage purposes (as per X.509 v3 key usage field)**

Keys may be used for authentication, non-repudiation, data encipherment, message integrity and session establishment. Certificates and CRLs are signed by the CA private key.

## **6.2 Private Key Protection**

### **6.2.1 Standards for cryptographic module**

No stipulation.

### **6.2.2 Private key (n out of m) multi-person control**

No stipulation.

### **6.2.3 Private key escrow**

No stipulation.

### **6.2.4 Private key backup**

The BGCA private key is kept encrypted in multiple copies on USB storage devices and CDRoms in safe places. The passphrase is in a sealed envelope kept in a safe.

### **6.2.5 Private key archival**

No stipulation.

### **6.2.6 Private key entry into cryptographic module**

No stipulation.

### **6.2.7 Method of activating private key**

Every activation of a BGCA private key MUST require entering of passphrase. Passphrase MUST meet conditions described in 6.4.

Every activation of end entity's private key MUST require entering of passphrase. Passphrase SHOULD be suitably strong.

### **6.2.8 Method of deactivating private key**

No stipulation.

### **6.2.9 Method of destroying private key**

After termination of the CA and after the archival period for archives has expired, all media that contain the private key of the CA will be securely and permanently destroyed, according to then best current practice.

## **6.3 Other Aspects of Key Pair Management**

The BGCA private key has a validity of ten years.

## **6.4 Activation Data**

### **6.4.1 Activation data generation and installation**

All pass phrases used by the CA have a length of at least 15 characters, and are suitably strong according to current best practice.

### **6.4.2 Activation data protection**

All pass phrases are known to all current staff members of the CA. Change of staff will imply change of pass phrases.

### **6.4.3 Other aspects of activation data**

No stipulation.

## **6.5 Computer Security Controls**

### **6.5.1 Specific computer security technical requirements**

The secure environment for CA operations are provided by bootable Knoppix Linux CDROM, which is used for CA machines working environment. Unauthorized access to that Knoppix Linux CDROM and USB storage devices are prohibited.

The CA machine is a computer with no network connection. Keys and necessary scripts are kept on USB storage device, which is held in safe. Unauthorised physical access to CA machine or USB storage device is prohibited.

Copy of keys are printed out and held also in a safe.

The systems used by the CA to hold on-line repositories are maintained at a high level of security by applying all recommended and applicable security patches. The machine(s) are protected by a suitable firewall.

### **6.5.2 Computer security rating**

No stipulation.

## **6.6 Life Cycle Technical Controls**

### **6.6.1 System development controls**

No stipulation.

### **6.6.2 Security management controls**

Software installed on the ca signing system is periodically checked for integrity by comparing strong cryptographic message digests. Firmware and hardware are not explicitly checked for correct operations.

### **6.6.3 Life cycle security ratings**

No stipulation.

## **6.7 Network Security Controls**

Certificates are issued on a machine that is not connected to any kind of network.

## **6.8 Cryptographic Module Engineering Controls**

No stipulation.

## 7. CERTIFICATE AND CRL PROFILES

### 7.1 Certificate Profile

The certificates issued in accordance with this CPS SHOULD follow the RFC 2459 [3] and the PKIX profiles.

#### 7.1.1 Version number

X.509 v3.

#### 7.1.2 Certificate extensions

The following extensions are set in root certificates:

1. X509v3 Basic Constraints: CRITICAL, CA:TRUE
2. X509v3 Subject Key Identifier
3. X509v3 Authority Key Identifier
4. X509v3 Key Usage: CRITICAL, Digital Signature, Certificate Sign, CRL Sign
5. X509v3 Subject Alternative Name: URI:<http://ca.balticgrid.org/>
6. X509v3 CRL Distribution Points: URI:<http://ca.balticgrid.org/bgca-crl.pem>

The following extensions are set in user certificates:

1. X509v3 Basic Constraints: CRITICAL, CA:FALSE
2. X509v3 Key Usage: CRITICAL
3. X509v3 Subject Key Identifier
4. X509v3 Authority Key Identifier
5. X509v3 Certificate Policies Identifier: 1.3.6.1.4.1.19974.11.1.1.1
6. X509v3 Issuer Alternative Name: URI:<http://ca.balticgrid.org/>
7. X509v3 CRL Distribution Points: URI:<http://ca.balticgrid.org/bgca-crl.pem>

The following extensions are set in host and service certificates:

1. X509v3 Basic Constraints: CRITICAL, CA:FALSE
2. X509v3 Key Usage: CRITICAL
3. X509v3 Subject Key Identifier
4. X509v3 Authority Key Identifier
5. X509v3 Certificate Policies Identifier: 1.3.6.1.4.1.19974.11.1.1.1
6. X509v3 Issuer Alternative Name: URI:<http://ca.balticgrid.org/>
7. X509v3 CRL Distribution Points: URI:<http://ca.balticgrid.org/bgca-crl.pem>
8. X509v3 Subject Alternative Name: dnsName: *FQDN of the host*

### **7.1.3 Algorithm object identifiers**

No stipulation.

### **7.1.4 Name forms**

Issuer: DC=org, DC=balticgrid, OU=domain.zz, CN=Baltic Grid Certification Authority

Natural persons: DC=org, DC=balticgrid, OU=domain.zz, CN=Firstname Lastname

Hosts: DC=org, DC=balticgrid, OU=domain.zz, CN=host/*fully.qualified.domain.name*

Services: DC=org, DC=balticgrid, OU=domain.zz,  
CN=*servicename/fully.qualified.domain.name*

### **7.1.5 Name constraints**

See section 3.1.2.

### **7.1.6 Certificate policy Object Identifier**

See section 1.2.

### **7.1.7 Usage of Policy Constraints extension**

No stipulation.

### **7.1.8 Policy qualifiers syntax and semantics**

No stipulation.

### **7.1.9 Processing semantics for the critical certificate policy extension**

No stipulation.

## **7.2 CRL Profile**

### **7.2.1 Version number**

X.509 v1.

## **8. SPECIFICATION ADMINISTRATION**

### **8.1 Specification change procedures**

The significance of the change is evaluated by the BGCA. If the change is determined to influence the trust procedures of relying parties and/or cooperating CAs, the BGCA **MUST** assign a new OID to the modified CPS.

Minor editorial or typographical changes to the policy and CPS **MAY** be made without approval.

All changes **MUST** be communicated to the interested parties.

### **8.2 Publication and notification policies**

The policy is available on <http://ca.balticgrid.org/>.

### **8.3 CPS approval procedures**

No stipulation.



## APPENDIX 1: Glossary

**Baltic States** – The Republics of Estonia, Latvia and Lithuania.

**Certification Authority (CA)** - An authority trusted by one or more users to create and assign public key certificates. Optionally the CA may create the user's keys. It is important to note that the CA is responsible for the public key certificates during their whole lifetime, not just for issuing them.

**CA-certificate** - A certificate for one CA's public key issued by another CA.

**Certificate policy (CP)** - A named set of rules that indicates the applicability of a certificate to a particular community and/or class of application with common security requirements. For example, a particular certificate policy might indicate applicability of a type of certificate to the authentication of electronic data interchange transactions for the trading of goods within a given price range.

**Certification path** - An ordered sequence of certificates which, together with the public key of the initial object in the path, can be processed to obtain that of the final object in the path.

**Certification Practice Statement (CPS)** - A statement of the practices which a certification authority employs in issuing certificates.

**Certificate revocation list (CRL)** - A CRL is a time stamped list identifying revoked certificates which is signed by a CA and made freely available in a public repository.

**EENet** - Estonian Educational and Research Network

**Estonian ID card** - ID card is mandatory for all Estonian residents, including Estonian citizens and resident aliens. The ID card functions as an electronic identity, enabling you to use services online conveniently and securely. You can also use your ID card to give digital signatures. According to Estonian law, digital signatures are equivalent to handwritten ones if the systems used to give and process it meet certain regulations.

**IPR** - Intellectual Property Rights

**Issuing certification authority (issuing CA)** - In the context of a particular certificate, the issuing CA is the CA that issued the certificate (see also Subject certification authority).

**Public Key Certificate (PKC)** - A data structure containing the public key of an end entity and some other information, which is digitally signed with the private key of the CA which issued it.

**Public Key Infrastructure (PKI)** - The set of hardware, software, people, policies and procedures needed to create, manage, store, distribute, and revoke PKCs based on public-key cryptography.

**Registration authority (RA)** - An entity that is responsible for identification and authentication of certificate subjects, but that does not sign or issue certificates (i.e., an RA is delegated certain tasks on behalf of a CA). [Note: The term Local Registration Authority (LRA) is used elsewhere for the same concept.]

**Relying party (RP)** - A recipient of a certificate who acts in reliance on that certificate and/or digital signatures verified using that certificate. In this document, the terms "certificate user" and "relying party" are used interchangeably.

**Subject certification authority (subject CA)** - In the context of a particular CA certificate, the subject CA is the CA whose public key is certified in the certificate

## APPENDIX 2: Key words for use in RFCs to Indicate Requirement Levels

According to RFC 2119 [2] Key words for use in RFCs to Indicate Requirement Levels , we specify how the main keywords used in RFCs should be interpreted.

Authors who follow these guidelines should incorporate this phrase near the beginning of their document:

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHAL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119.

1. **MUST** This word, or the terms "REQUIRED" or "SHALL", mean that the definition is an absolute requirement of the specification.
2. **MUST NOT** This phrase, or the phrase "SHALL NOT", mean that the definition is an absolute prohibition of the specification.
3. **SHOULD** This word, or the adjective "RECOMMENDED", mean that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
4. **SHOULD NOT** This phrase, or the phrase "NOT RECOMMENDED" mean that there may exist valid reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behaviour described with this label.
5. **MAY** This word, or the adjective "OPTIONAL", mean that an item is truly optional. One vendor may choose to include the item because a particular marketplace requires it or because the vendor feels that it enhances the product while another vendor may omit the same item. An implementation which does not include a particular option **MUST** be prepared to interoperate with another implementation which does include the option, though perhaps with reduced functionality. In the same vein an implementation which does include a particular option **MUST** be prepared to interoperate with another implementation which does not include the option (except, of course, for the feature the option provides.)

## REFERENCES

- [1] EuroPKI Certificate Policy : VERSION 1.1 January 2004 [<http://www.europki.org/ca/root/>]
- [2] RFC 2119 Key words for use in RFCs to Indicate Requirement Levels March 1997  
[<ftp://ftp.isi.edu/in-notes/rfc2119.txt>]
- [3] RFC 2459 Internet X.509 Public Key Infrastructure: Certificate and CRL Profile January 1999 [<ftp://ftp.isi.edu/in-notes/rfc2459.txt>]