About Certificates and Public-Key Infrastructure

What is Public-Key Infrastructure (PKI)?

The term “Public-key infrastructure” refers to a set of services that use the methods of public-key cryptography to provide security functions for an organization, a group of cooperating organizations, or the Internet as a whole. The basic security services are assurance of the identity of a sender of information, assurance of the integrity of information, and protection of information from disclosure to unauthorized persons. A certificate authority such as the UW Services CA is one component of a PKI.

Where can I learn more about certificates and PKI?

There is a lot of information available. One source of introductory documents is http://pkiforum.org/whitepapers.html, from the OASIS PKI Forum. There are lots of good books about PKI and related security issues; one comprehensive book is: “Understanding the Public-Key Infrastructure: Concepts, Standards, and Deployment Considerations” by Carlisle Adams, Steve Lloyd, Stephen Kent (ISBN: 157870166X)

Note that in the field of PKI there are many technologies, and many differing opinions about how to use them.

What is a digital certificate?

A digital certificate contains the name of the entity that is being identified, the entity’s public key, the name of the issuer, and other information such as validity dates and the cryptographic data that proves that the certificate is authentic. Your browser lets you view the certificates that it has stored.

What is a Certificate Authority?

A digital certificate is issued by a special service called a Certificate Authority (CA). There are many commercial CA’s whose verification information comes pre-installed on many personal computers and browsers. This permits the secure use of Web sites that use certificates issued by those authorities.

What is a CA certificate?

A CA certificate establishes the name and public key of a certificate authority. Upon installing a CA certificate, your browser can verify the identity of web sites and other entities whose certificates were issued by that CA.
A CA certificate contains the name of the CA, the CA's public key, and other information such as validity dates. Upon installing a CA certificate, your browser can verify the identity of web sites whose web server certificates were issued by that CA.

Should I always accept and install a CA certificate when asked?

No. If you install a CA certificate issued by a malicious or negligent CA, your browser could accept as valid fraudulent identities presented by web sites. This could lead to stolen passwords or other kinds of fraud. You should only accept CA certificates from sites you trust, and only for legitimate purposes.

Installing the UW Services CA Certificate

Why should I install the UW Services CA Certificate?

The University of Washington issues certificates to many of the Web services at the university. In order for you to easily use those services, you must tell your browser or email program that you trust the UW Services CA and accept certificates issued by the UW.

What if I don't install the UW Services CA Certificate?

If you haven't installed the UW Services CA Certificate, and you use a secure UW Web site or service that uses a certificate issued by the UW Services CA, then your browser will display a warning such as "Website certified by an Unknown Authority". To avoid such warnings for UW services, install the UW Services CA Certificate. By doing so, you tell your browser to trust certificates issued by the university, but to continue to warn you appropriately of other sites you should not trust.

How do I check if the UW Services CA Certificate is in my browser?

Use this test page. The UW Services CA certificate is properly installed if you can open the test page without any warnings about the validity of the server certificate. If your browser does warn you that the certificate is invalid or cannot be verified, then you may not have installed the UW Services CA certificate. Try the install page again.

Why does Safari require a separate installer?

Safari, the default Web browser for Mac OS X, does not provide a user interface for installing new CA certificates, so we created a separate installer for Safari to simplify the process. When Apple releases a version of Safari that supports certificate management, we will update the UW Services CA Certificate installation page accordingly.

How do I install the UW Services CA Certificate on IE7 for Windows Vista?

Please follow these manual instructions to install the UW Services CA root certificate on Internet Explorer 7 for the Windows Vista® operating system.

About the UW Services CA

How do I request a certificate?

Our technical information section describes how to request a certificate for your server or service.

Where do administrators go for further technical information?

Refer to the section on technical information for issues related to requesting and using certificates issued by the UW Services CA.

Does the UW Services CA issue certificates to individuals, e.g. for use with secure email?

No, it does not provide this service. Certificates that identify individuals, rather than machines and services, might be offered in the future. In the meantime if you require such a certificate various commercial services, such as Thawte offer certificates for individuals, for secure (i.e., S/MIME) email and other purposes.

How do I let UW Information Technology know about a particular need for certificates that I have?

Send mail to help@u.washington.edu. We'll be happy to discuss it with you.

Will all UW web servers eventually get certs from the UW Services CA?

No, not at all. Even when the UW Services CA expands its scope there will be many cases where it is still appropriate for a web server to use a certificate from a commercial CA. For example, if a web server has many users from outside the UW it will probably want to use a commercial CA certificate.
Washington state law, in RCW 19.34.231, says that state agencies may not act as certificate authorities. Is the UW Services CA in violation?

RCW 19.34 sets requirements for certificate authorities that issue certificates to identify people for use in conducting official public business using digitally-signed documents. The UW Services CA issues certificates only for servers and other system processes, and so is not covered by this legislation.

Will the UW Services CA ever be in browsers via a parent.edu root CA?

Unfortunately at this point there is no CA playing the role of a higher-ed root CA. Even when there was one (operated by CREN, which has since folded), the only browser they were able to get their root into was Opera.

The process of a getting a root into Internet Explorer (or really into Windows) is mysterious and almost certainly involves lots of money to pay for an intensive security audit. (See MS Root Certificate Program.) Internet2 is planning to operate a new higher-ed root CA, but getting its root into the browsers is unlikely for the same reasons.

Does the UW Services CA issue certificates signed with the SHA-2 algorithm?

Yes, beginning 2016-04-27. SHA-1 certificates for legacy applications can be requested by sending email to help@uw.edu. SHA-1 Support will be reduced over the next few years--see UW CA SHA-1 Sunset for details.