Information

- Questions will be answered at the end.
- Please submit questions to *Erick Mendoza* using the chat function.

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Securing Niagara, Part 2

- Java 1.7.0.25 Update Announcement
- Review basic hardening steps
- Discuss basic usage of SSL functionality
- Discuss VPNs
- Highlight recent update changes
- The Future
- Questions

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Review

- System security is like an onion:
  - No, not because it smells bad (although it can)
  - It is made up of **LAYERS**

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Review

Passwords

- Change the Default Platform Credentials
- Use Strong Passwords
- Enable the Account Lockout Feature
- Use the Password History
- Use the Password Reset Feature
- Leave the “Remember These Credentials” Box Unchecked

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Review

Account Management

- Use a Different Account for Each User
- Assign the Minimum Required Permissions
- Use a Single Super User
- Require Super User Permissions for Program Objects
- Use the Minimum Required Permissions for External Accounts

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Review

Authentication

- Use “Digest” Authentication in the FoxService
- Set the FoxService Legacy Authentication to “Strict”
- Use “cookie-digest” Authentication in the WebService

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Review

TLS/SSL & Certificate Management

- Enable Platform SSL Only (3.7+ only)
- Enable Fox SSL Only (3.7 only)
- Enable Web SSL Only
- Enable SSL on Other Services
- Set Up Certificates

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Review

Additional Settings

- Disable FTP and Telnet
- Remove the serial shell jumper
- Disable Unnecessary Services
- Blacklist Sensitive Files and Folders
- Update NiagaraAX to the Latest Release

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Review

External Factors

- Install JACEs in a Secure Location (locked room, wiring in conduit, etc)
- Make Sure that Stations Are Behind a VPN
- Even internally, make sure that stations are behind a firewall with only necessary ports open
- Protect your backups

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SSL

- Key Pair
- Certificate
- Self Signed Certificate
  - Trusted Certificate
- Certificate Authority (CA)
- Certificate Chain
- SSL Handshake
- SSL and NiagaraAX

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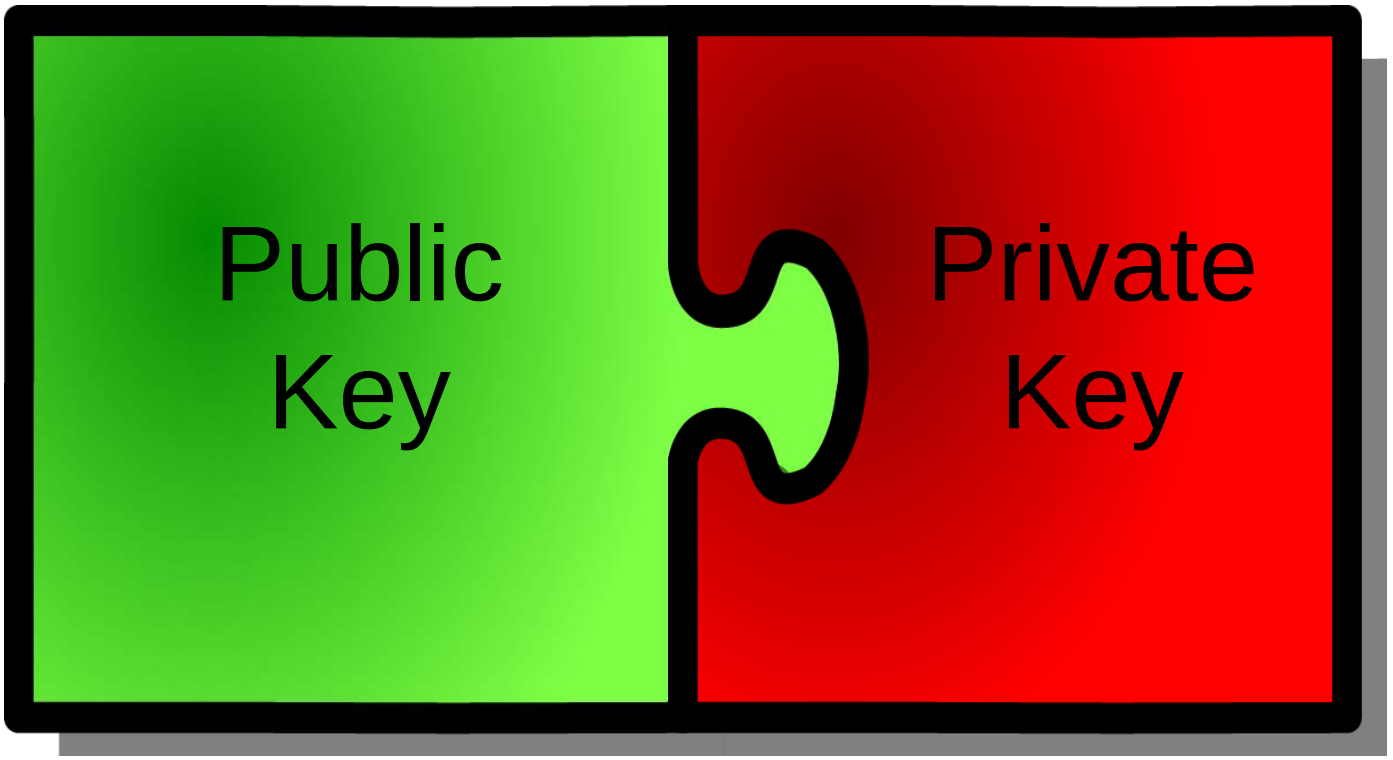
SSL – Key Pair



Common sizes: 1024 and 2048 bits

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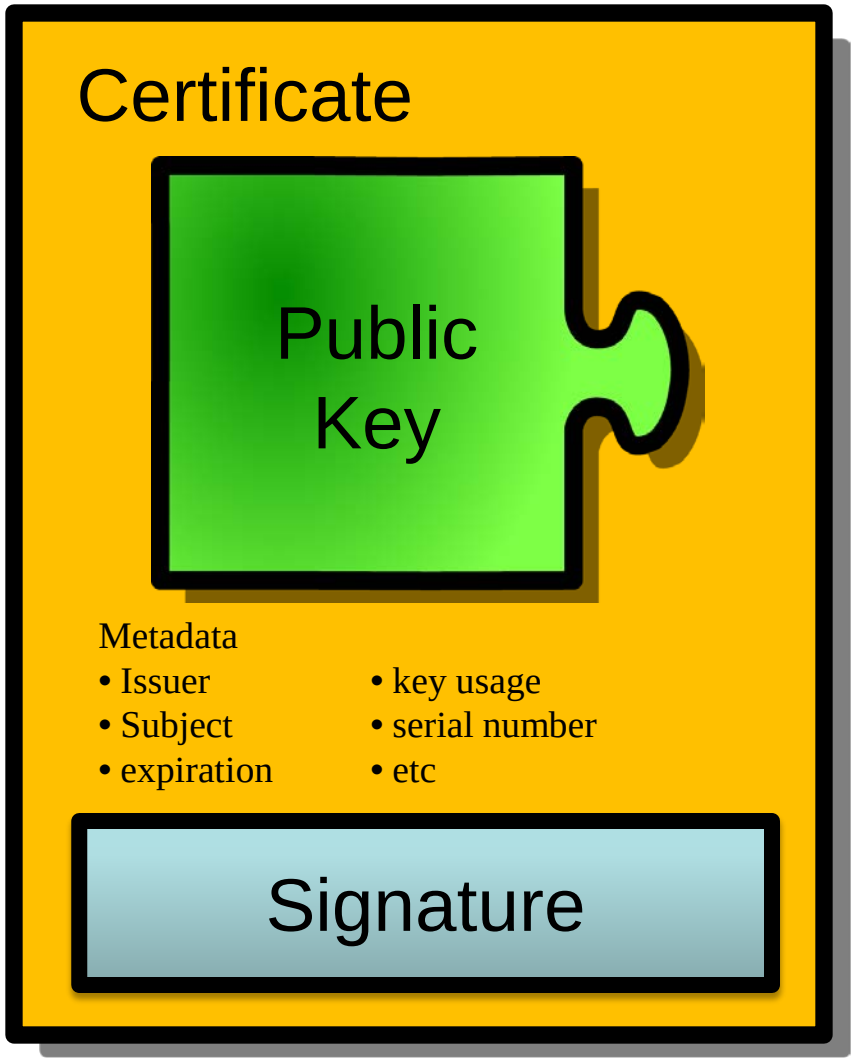
SSL – Certificate



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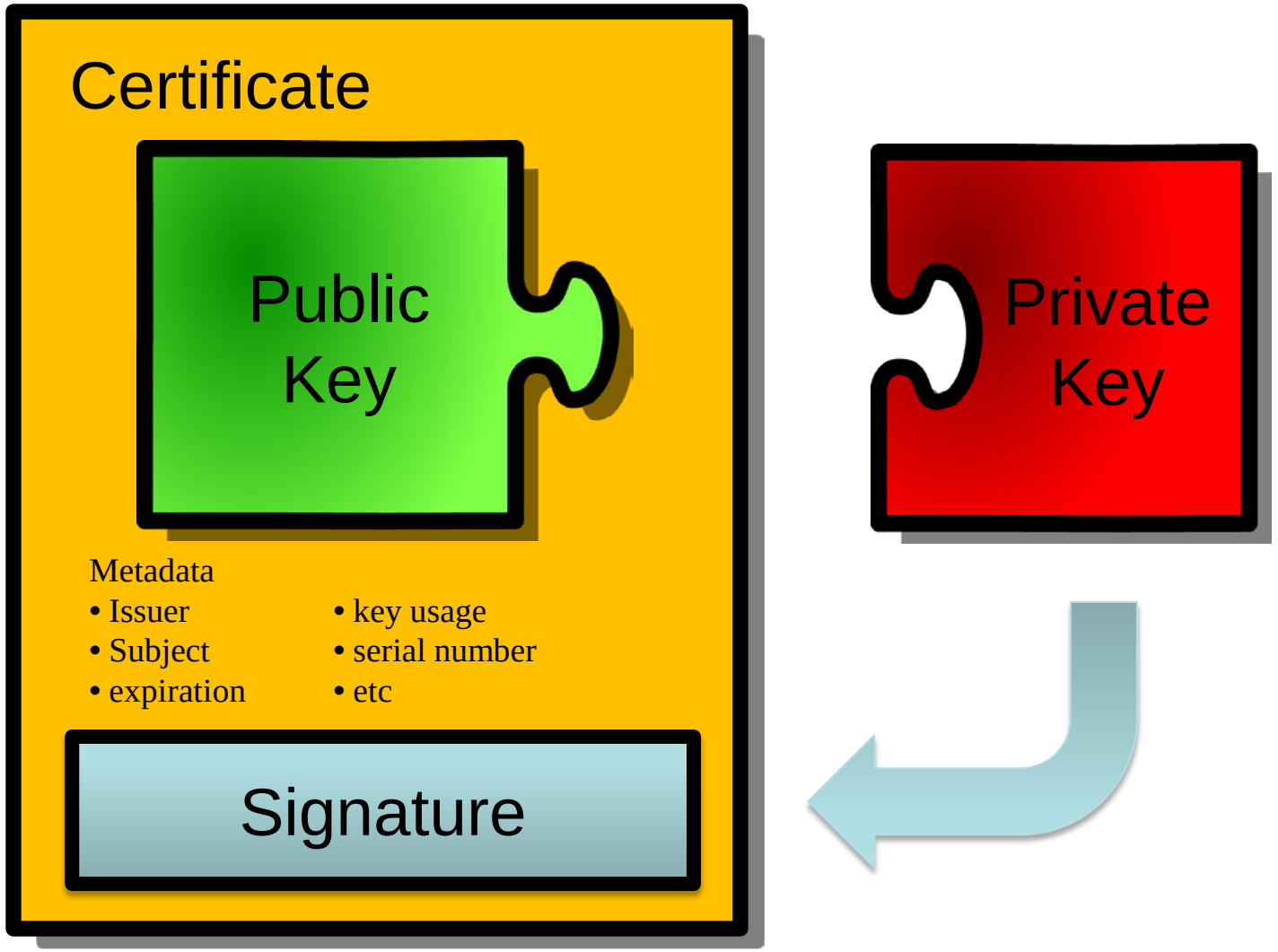
SSL – Self Signed Certificate



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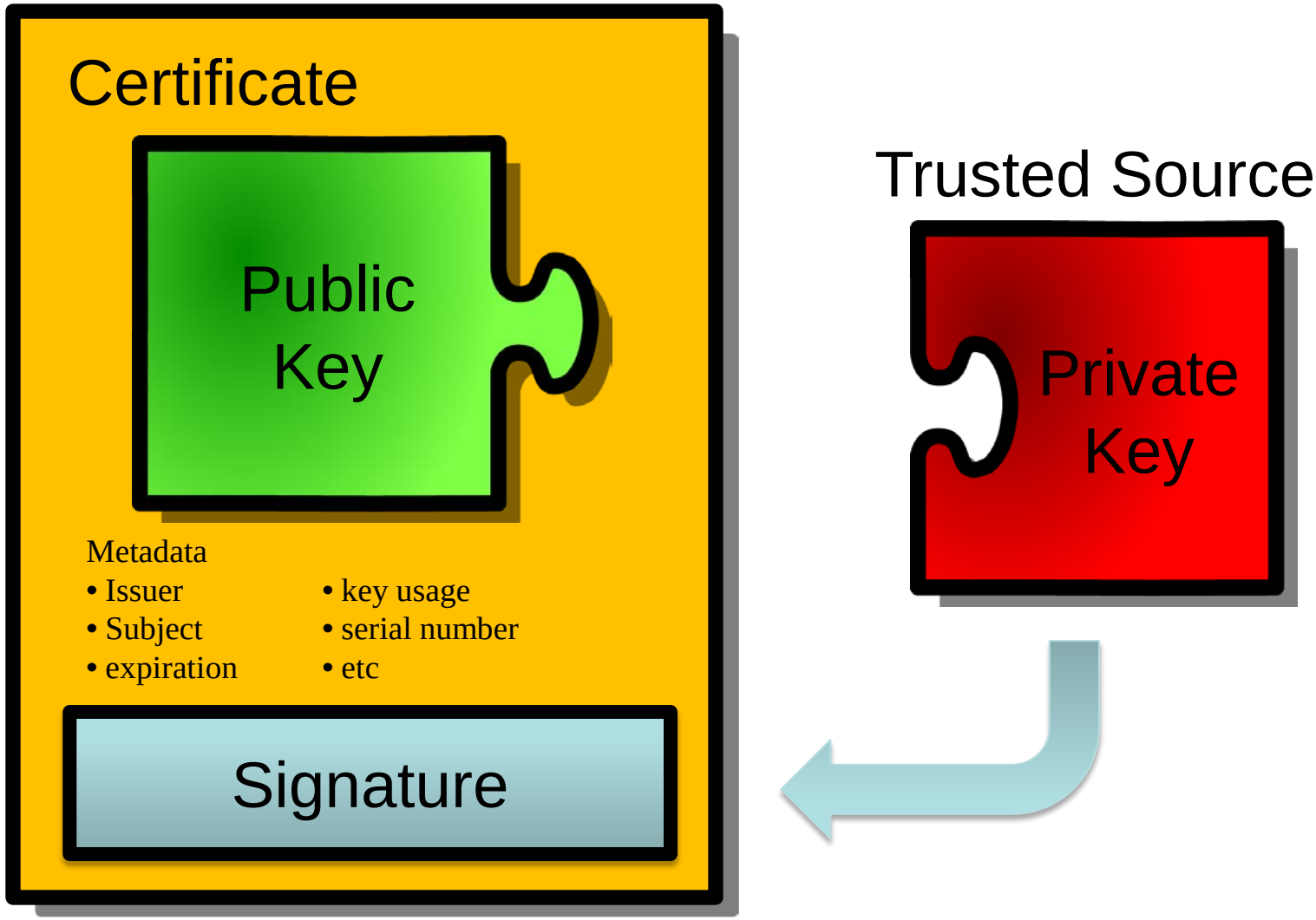
SSL – Trusted Certificate



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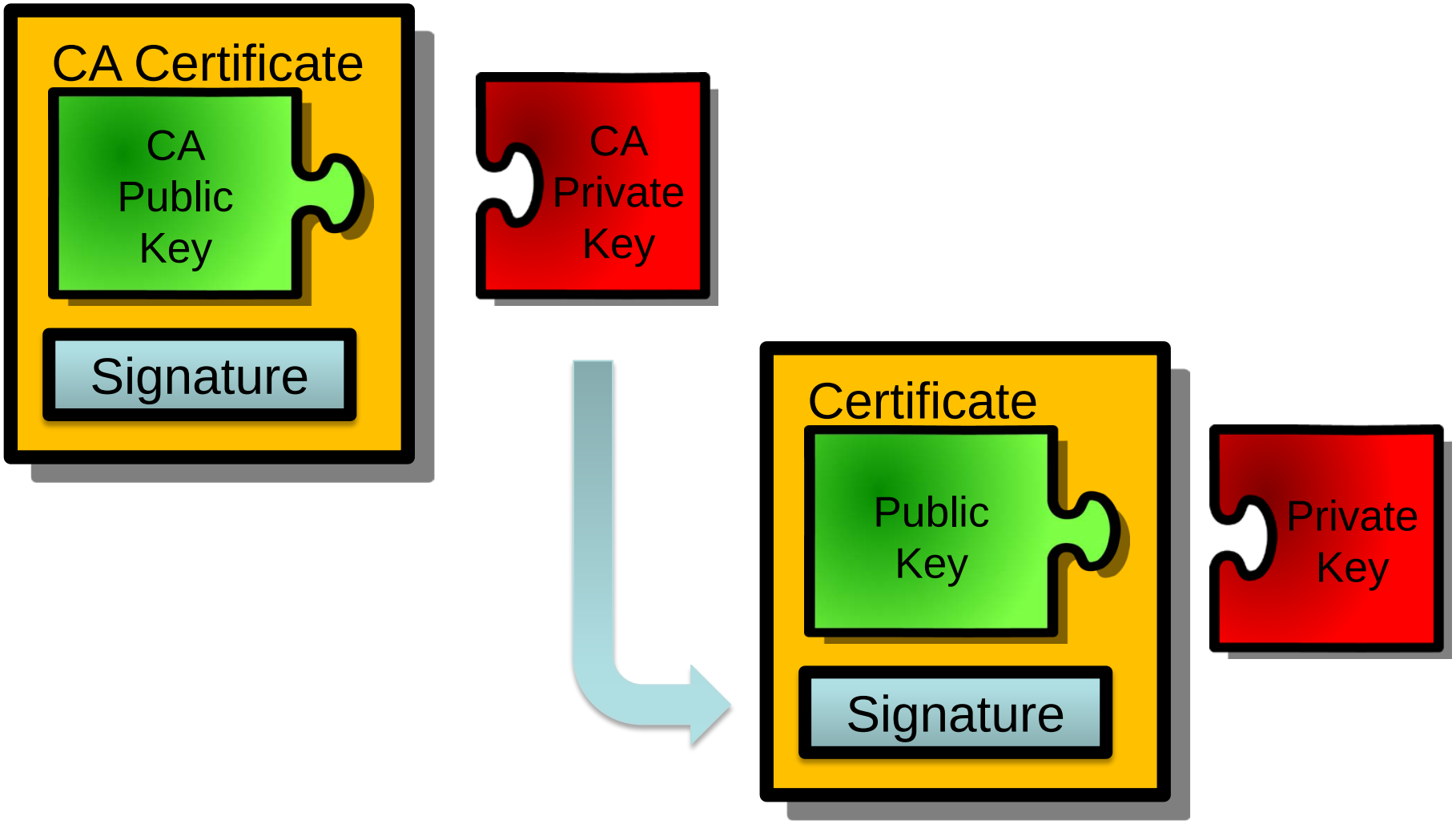
SSL – Signed Certificate



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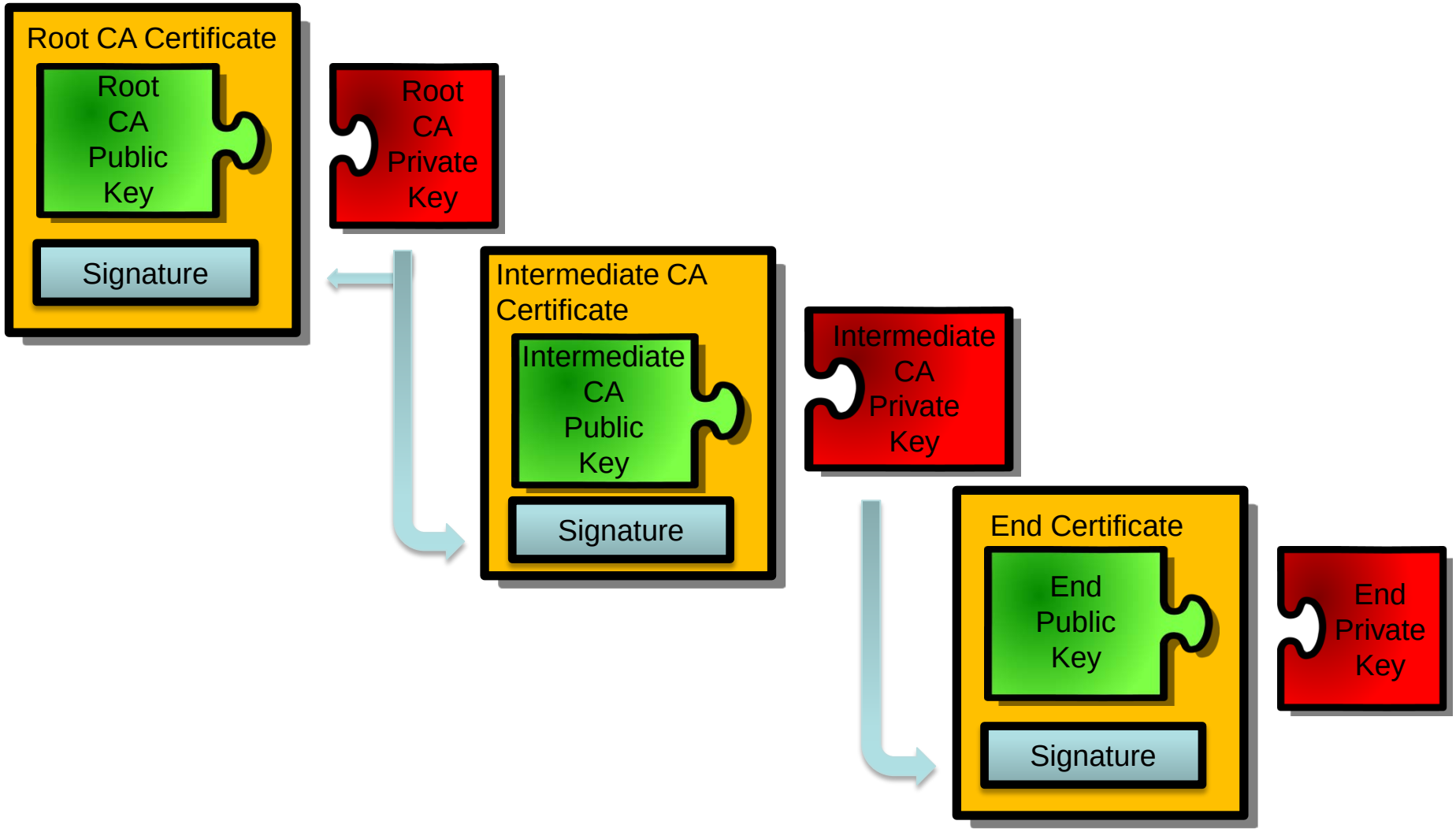
SSL – Certificate Chain



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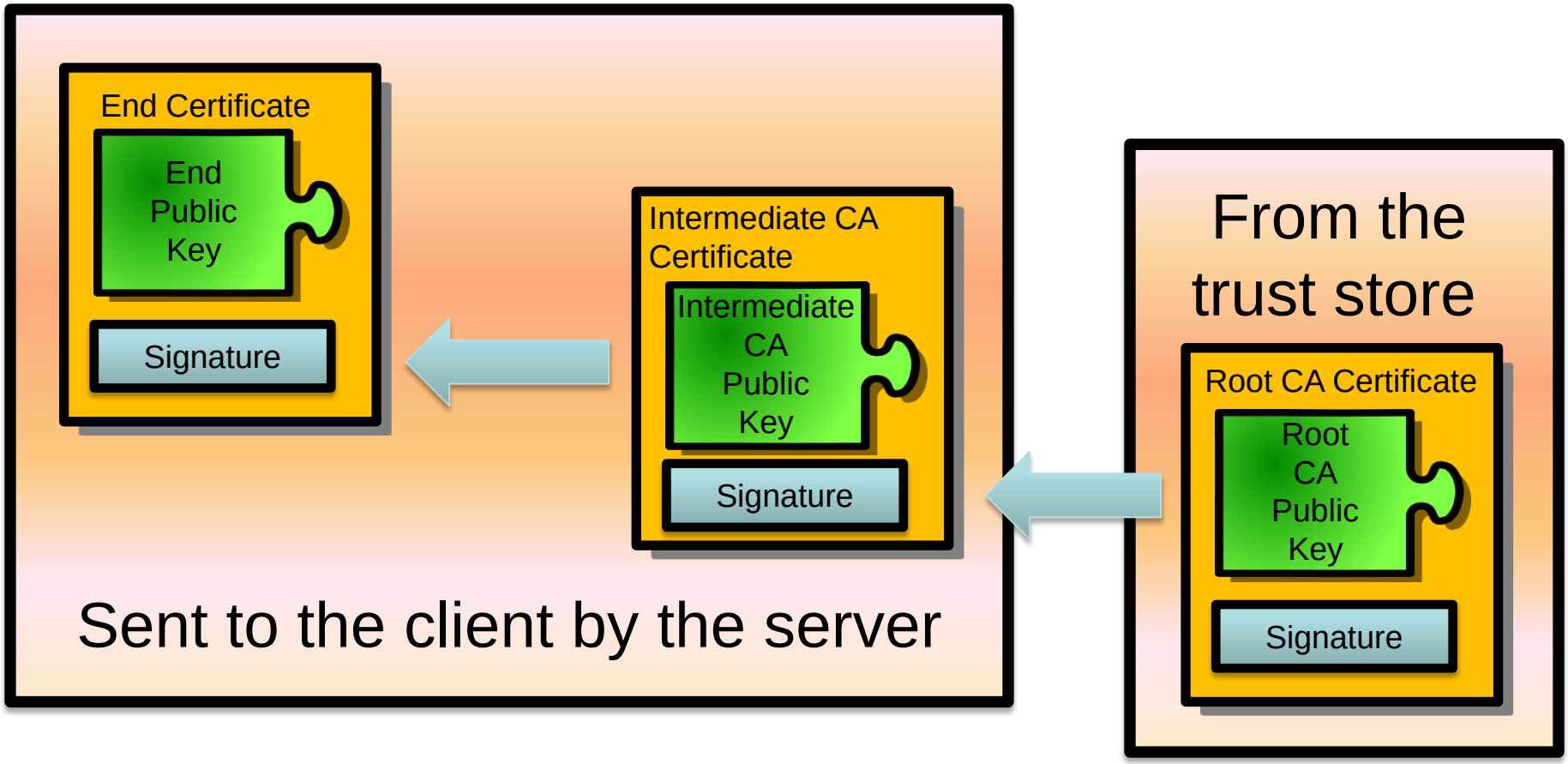
SSL – Certificate Validation



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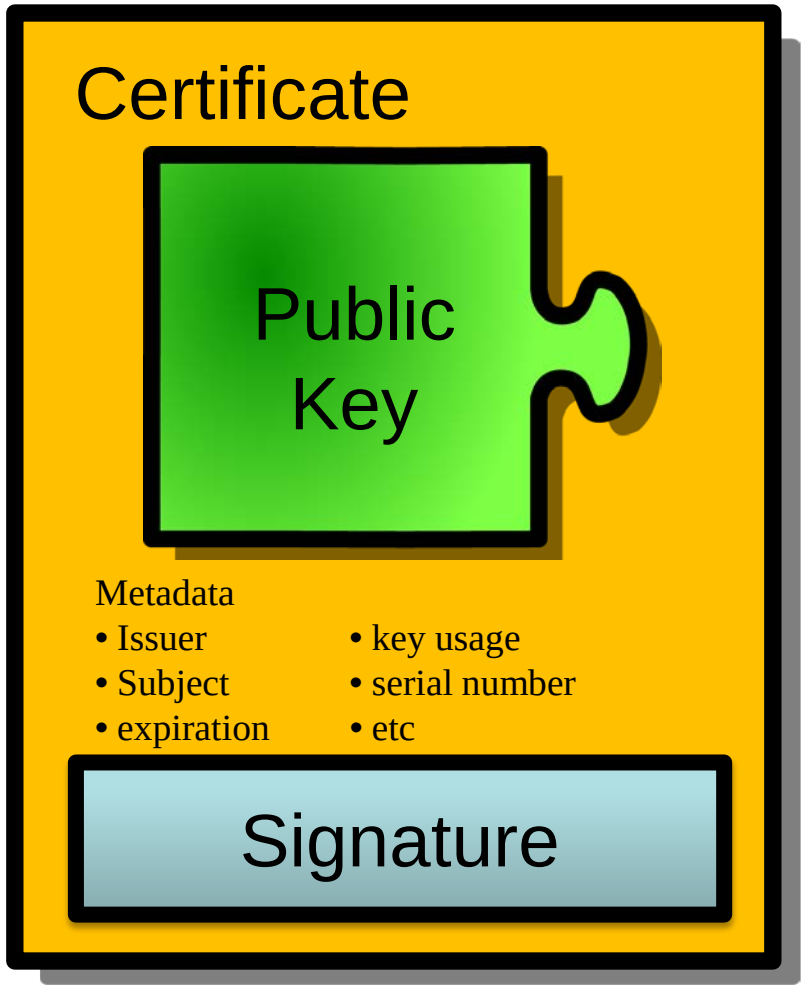
SSL – Certificate Validation

- Certificate chain is valid and trusted
- Distinguished name matches server address
- Key usage is valid
- Certificate is in the valid date range



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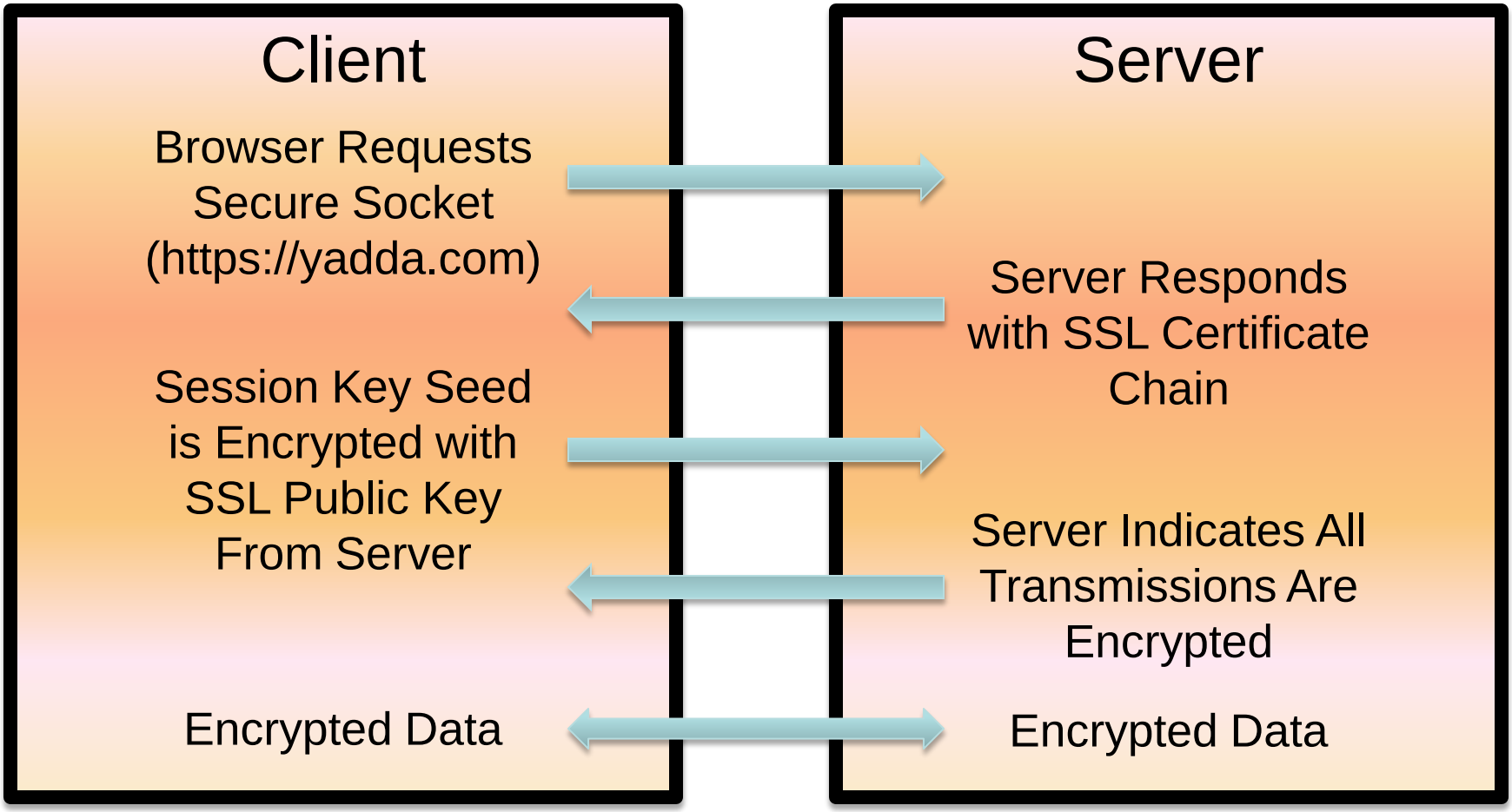
SSL – Handshake



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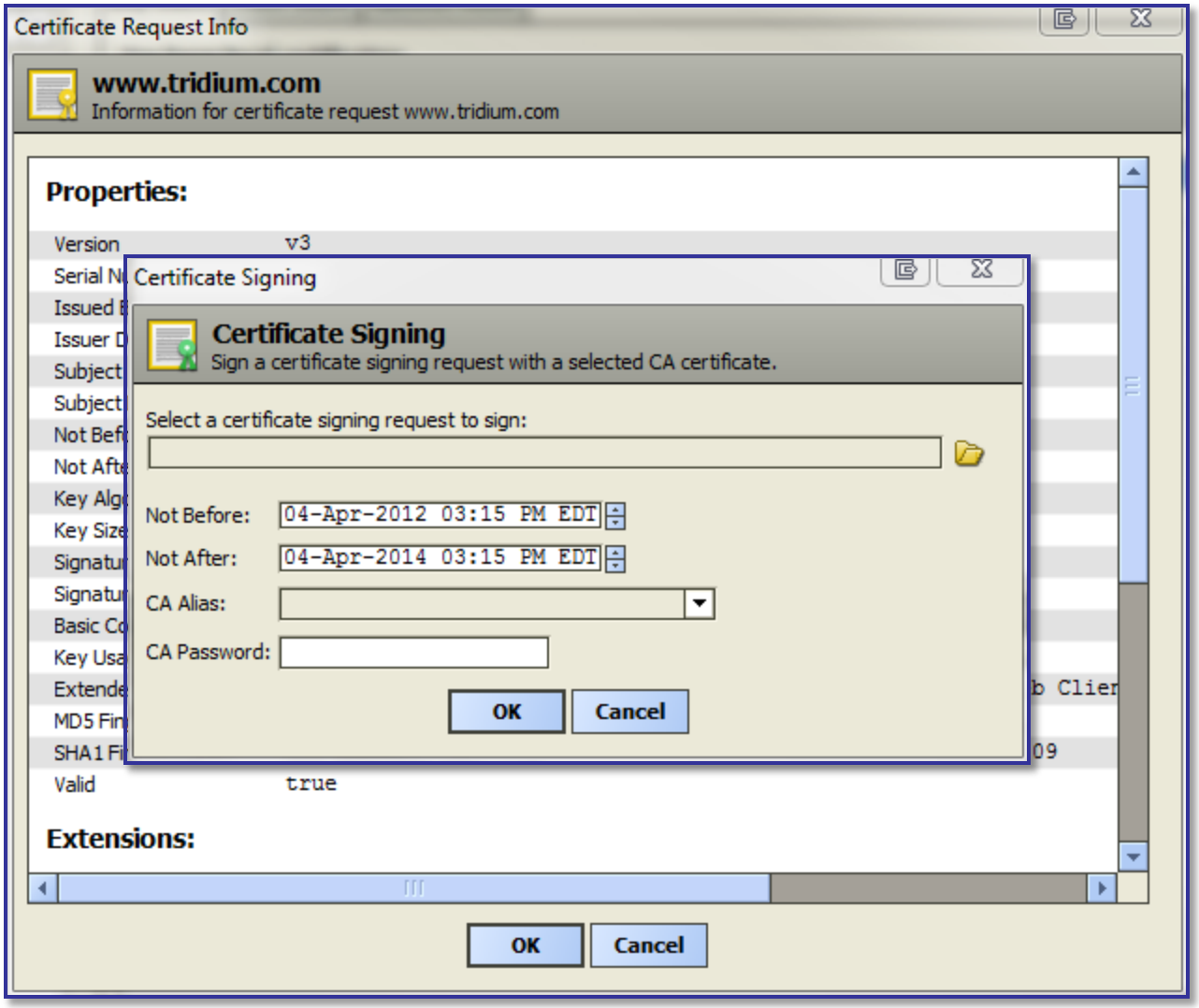
SSL – Certificate Tools



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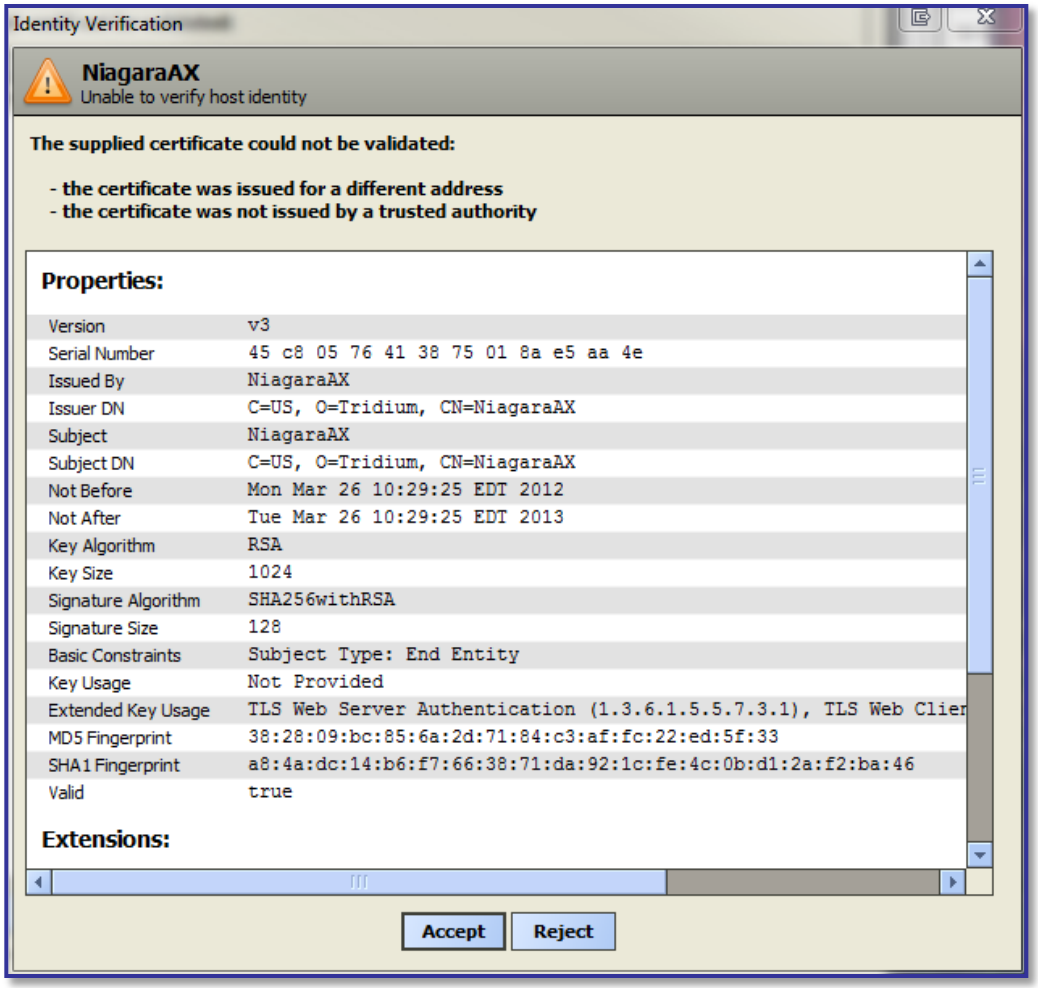
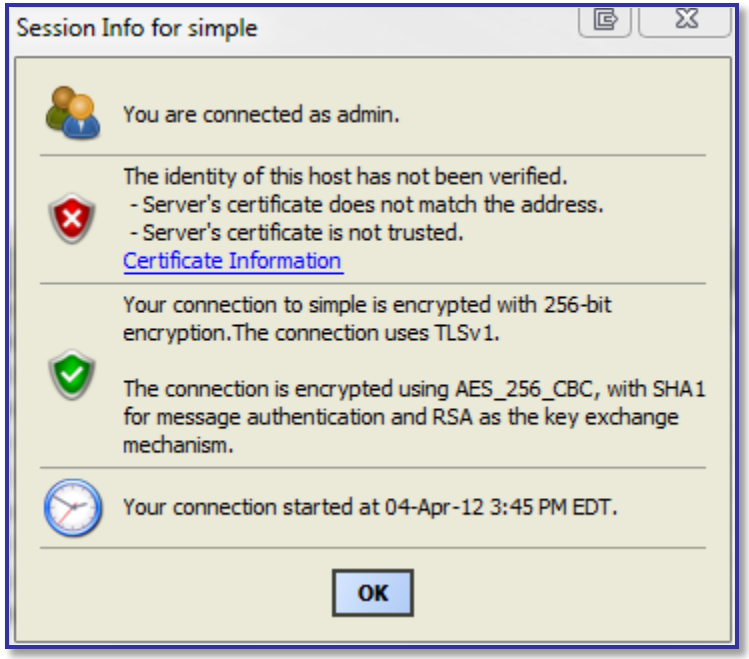
SSL – Client Interface





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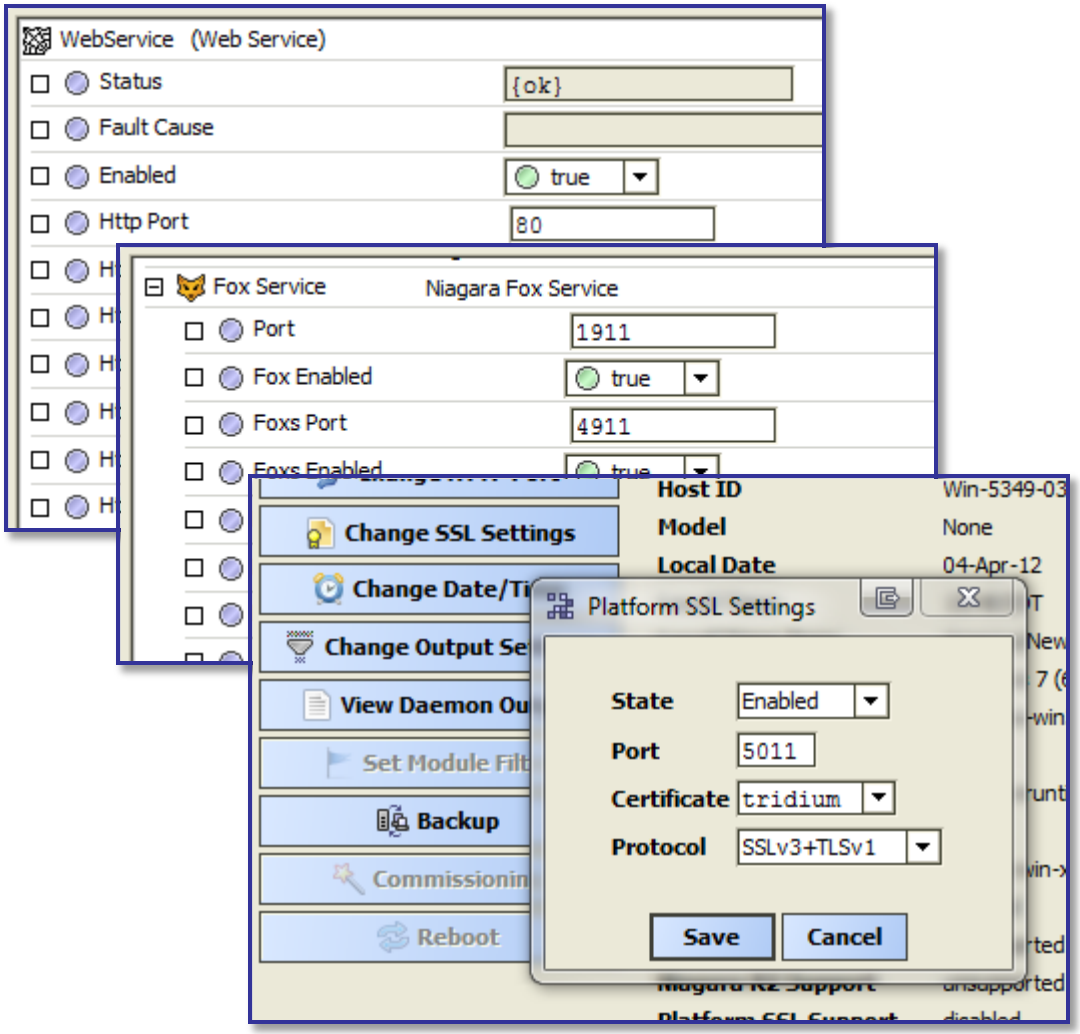
SSL – Server Configuration

- Web Service (port 443)
- Fox Service (port 4911)
- Niagarad (port 5011)



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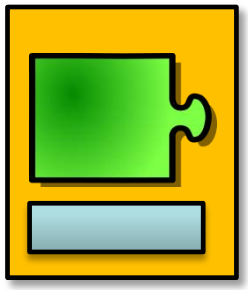
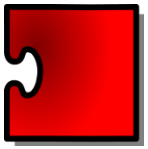
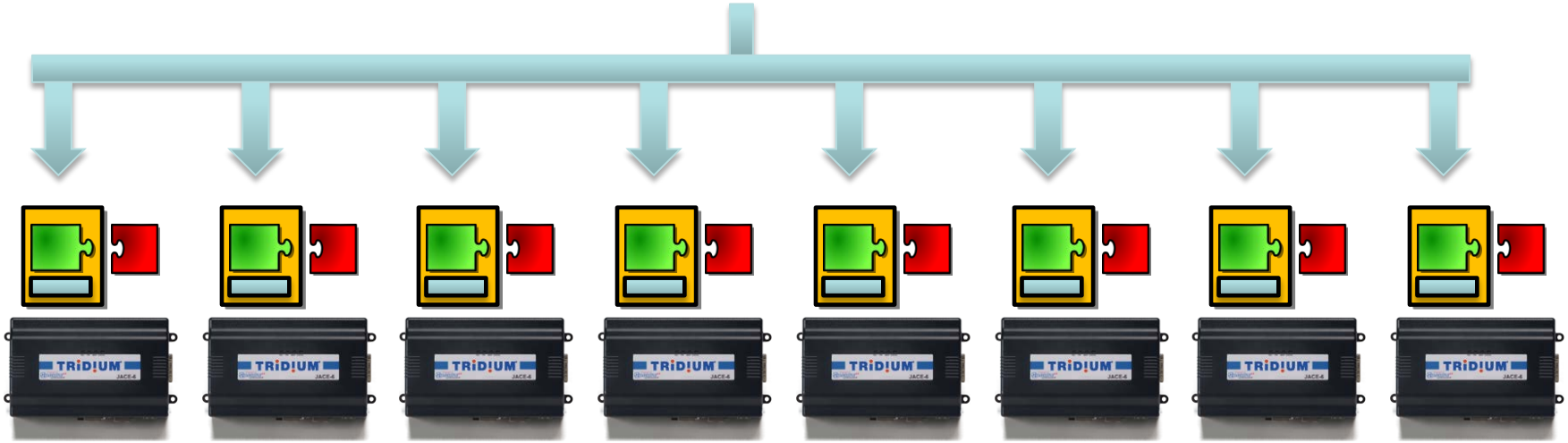
SSL – Small Network Example

CA Certificate Installed
on Client Machines
in Their Trust Store





CA Private Key Used to
Sign Server Certificates



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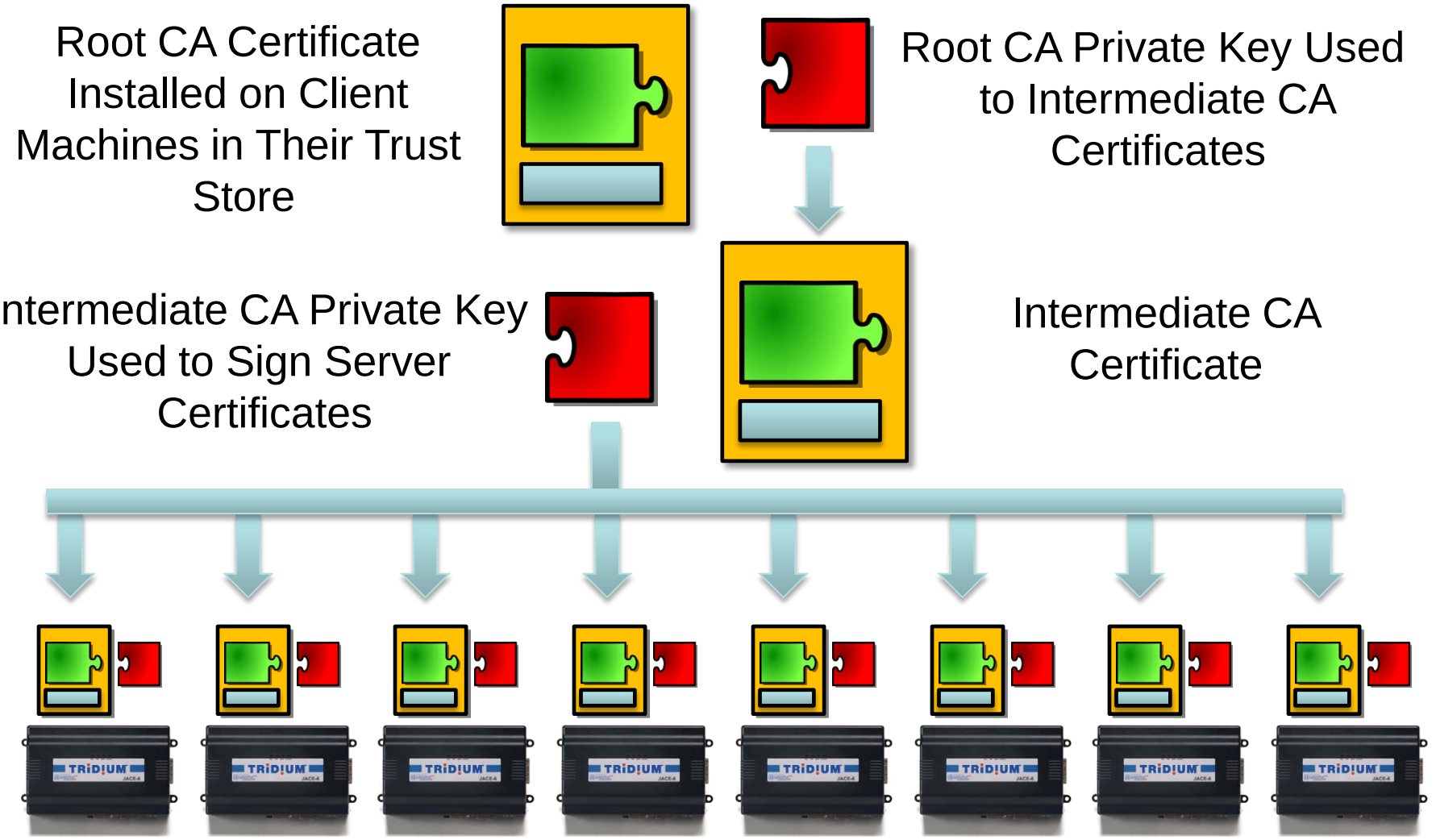
SSL – Large Network Example

Root CA Certificate Installed on Client Machines in Their Trust Store

Root CA Private Key Used to Intermediate CA Certificates

Intermediate CA Private Key Used to Sign Server Certificates

Intermediate CA Certificate



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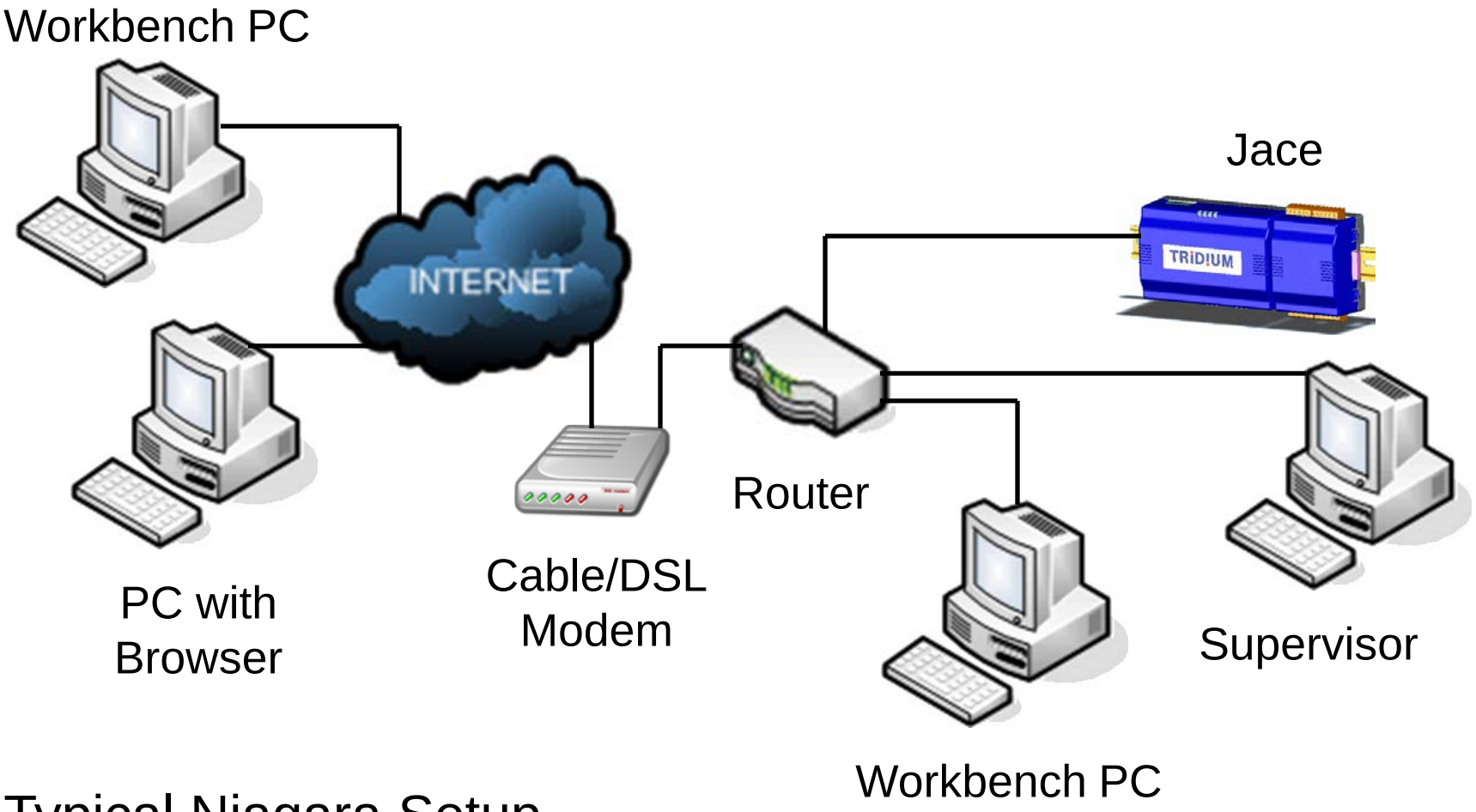
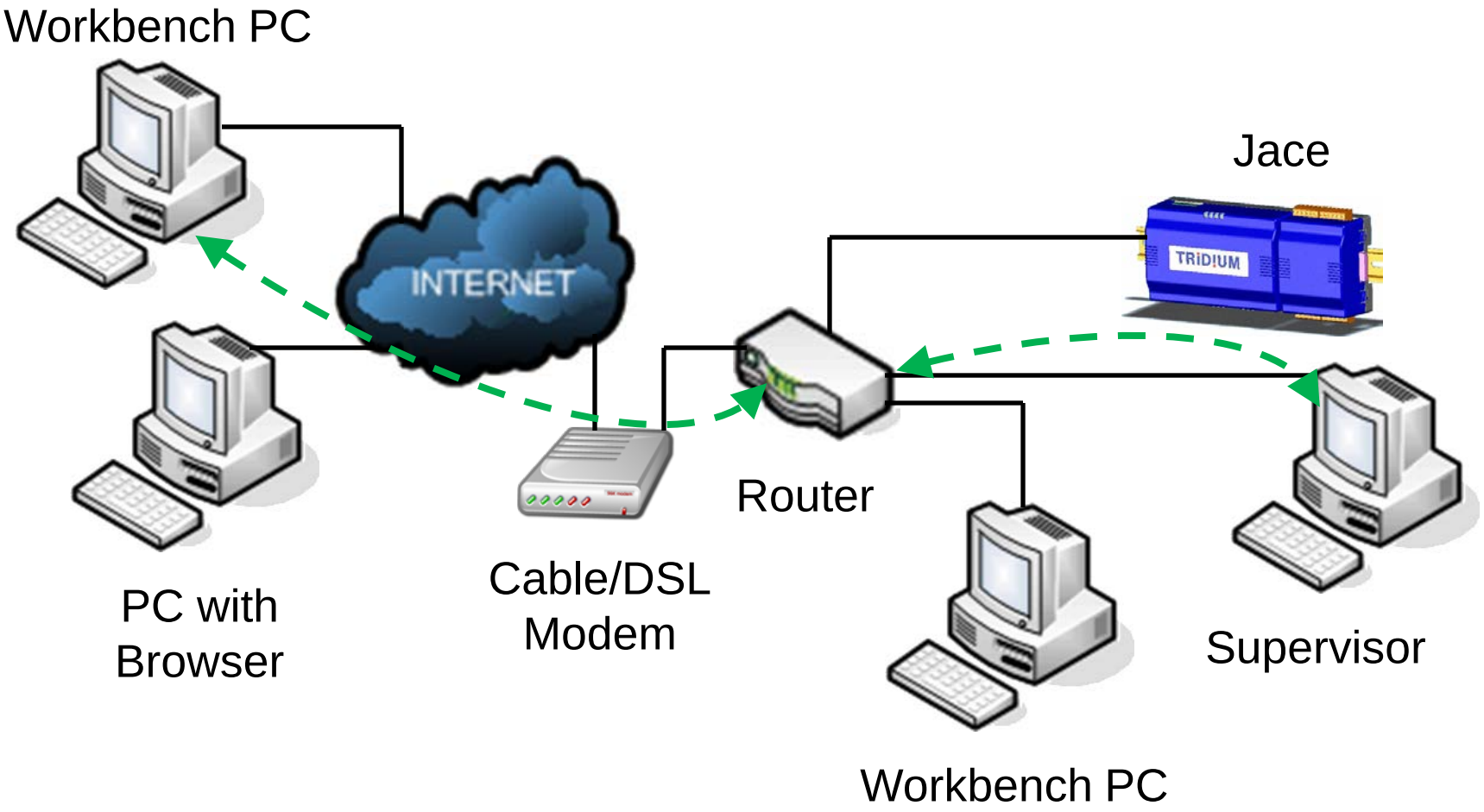
VPN



Typical Niagara Setup

- with all ports forwarded, it gives full access to web, fox, niagarad

VPN



•A port scan would reveal all open Niagara ports
•Attackers could use weak credentials or known vulnerabilities to exploit the system.

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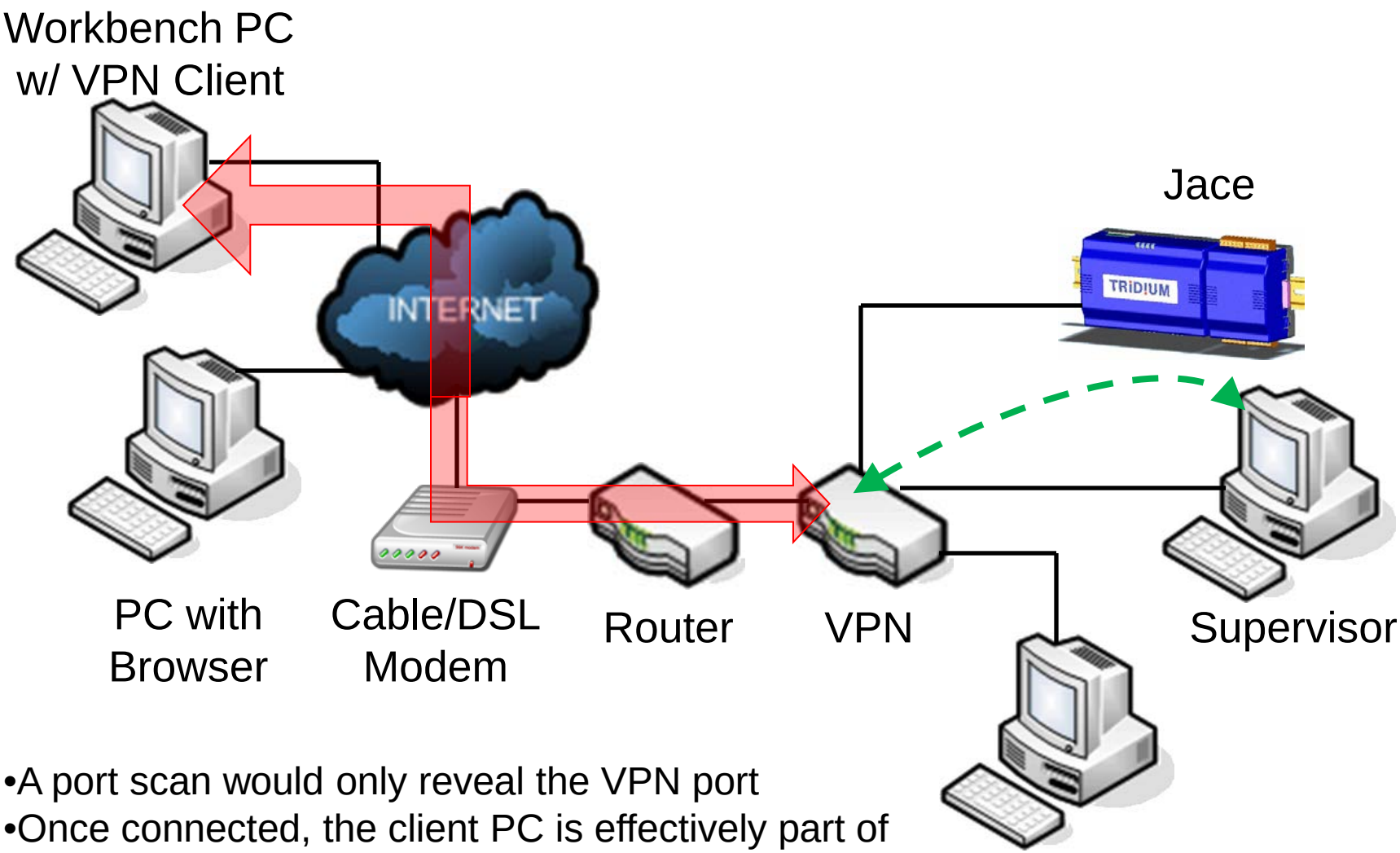
VPN



- A port scan would only reveal the VPN port
- Once connected, the client PC is effectively part of the local network.

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VPN

- The VPN Guide discusses all this in great detail
- It also provides an example setup using a ZyWall USG 20
- Supports the built in VPN clients in Windows, Android and iOS.
- In addition to client to server connections, a VPN can also support a persistent connection between remote networks
  - Station to station connections

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Niagara Updates

- Enhanced password management
  - PBKDF2-SHA256
  - AES-256
- Enhanced digest authentication
  - SCRAM-SHA256
- Miscellaneous other security fixes

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The Future…

- Always improving!
- Encrypted backups
- Rolling keys
- Two factor authentication
- Sandboxing
- …and more!!

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FAQ

- Won’t SSL slow things down?
- What is the difference between a firewall and a VPN?
- If I’m using a VPN, do I need to use SSL?
- If I’m using SSL, do I need to use a VPN?
- If Tridium is pushing “secure by default”, why isn’t SSL enabled by default?

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Sources for Good Information

- Niagara Hardening Guide
  - Available next week
- VPN Guide
  - Available next week
- Niagara SSL Documentation (docSSL)
  - In 3.7 release
- SNA Forum on LinkedIn
- ICS-CERT
  - http://ics-cert.us-cert.gov/
- Niagara Central
  - http://www.niagara-central.com
- Schneier on Security
  - http://www.schneier.com/

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Questions

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