IBM eServer™

z/OS Security Server Overview

Vanguard Enterprise Security Expo

Reno, Nevada

6 June 2004

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    - DCE, EIM, Firewall Technologies, LDAP,
    - Network Authentication Services (i.e. Kerberos), OCEP

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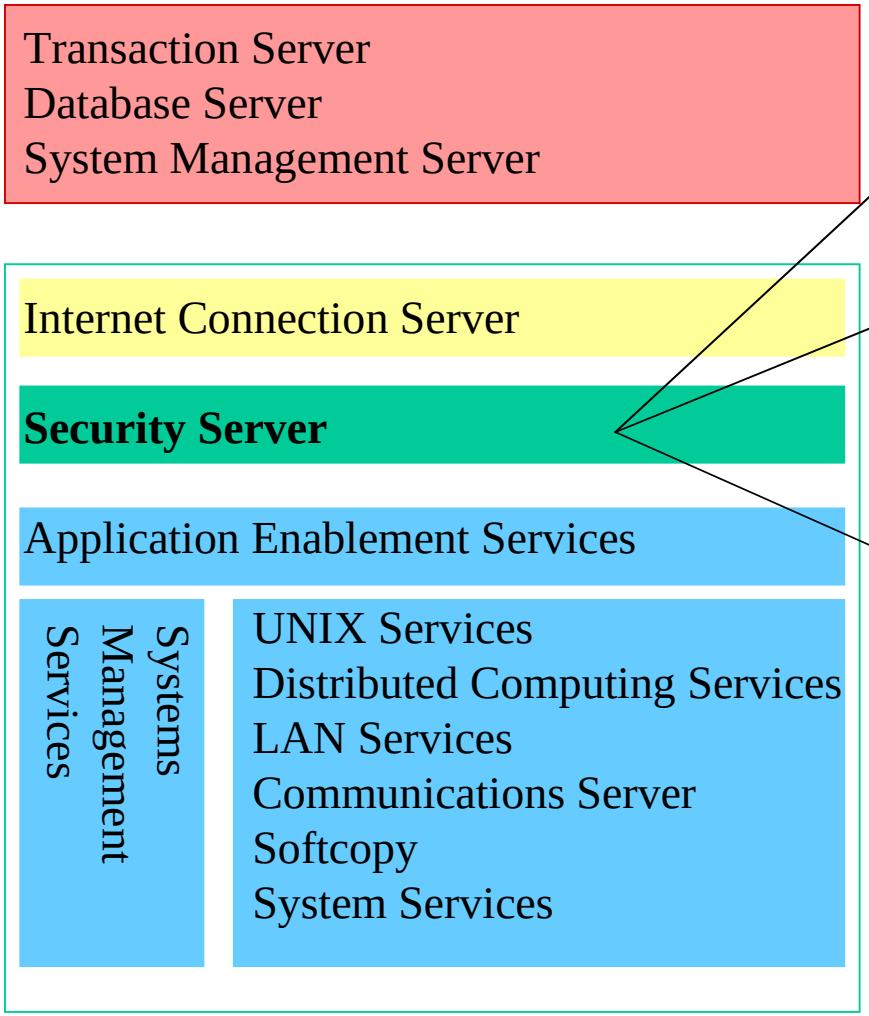
z/OS Security Server Restructure in z/OS V1R5



z/OS Security Server
- RACF

z/OS Cryptographic Services
- ICSF
- OCSF
- PKI Services
- System SSL

z/OS Integrated Security Services
- DCE
- EIM
- Firewall Technologies
- LDAP
- Network Authentication Services
- OCEP

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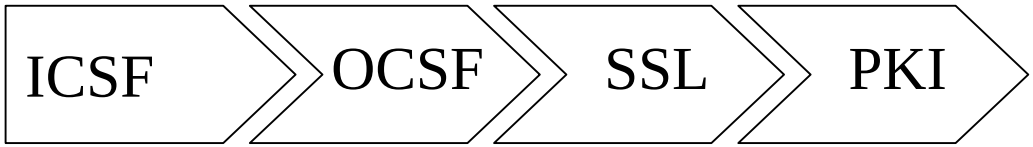
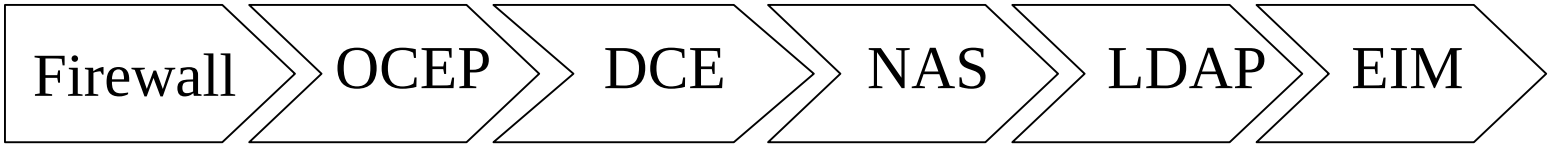
z/OS Security Server

z/OS Cryptographic Services



z/OS Integrated Security Services



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z/OS Security Server - RACF

- **RACF – Resource Access Control Facility**
- The RACF element of the z/OS Security Server is a software tool for use by:
  - Security Administrators
  - Auditors
- RACF is used to implement, and monitor the implementation of an installation's security policies
- End user interaction with RACF is minimized by design
- z/OS Resource Managers invoke or call for security services through a set of architected interfaces on z/OS known as the **System Authorization Facility** or **SAF**

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z/OS Security Server - RACF…

User Identification
Authentication

Resource authorization checking
System access control

z/OS Security Server - RACF

Security
Administration

Security console
•Violation reporting

Audit Reports
Integrity Reports

RACF database
• Primary and backup
• Local and remote sharing

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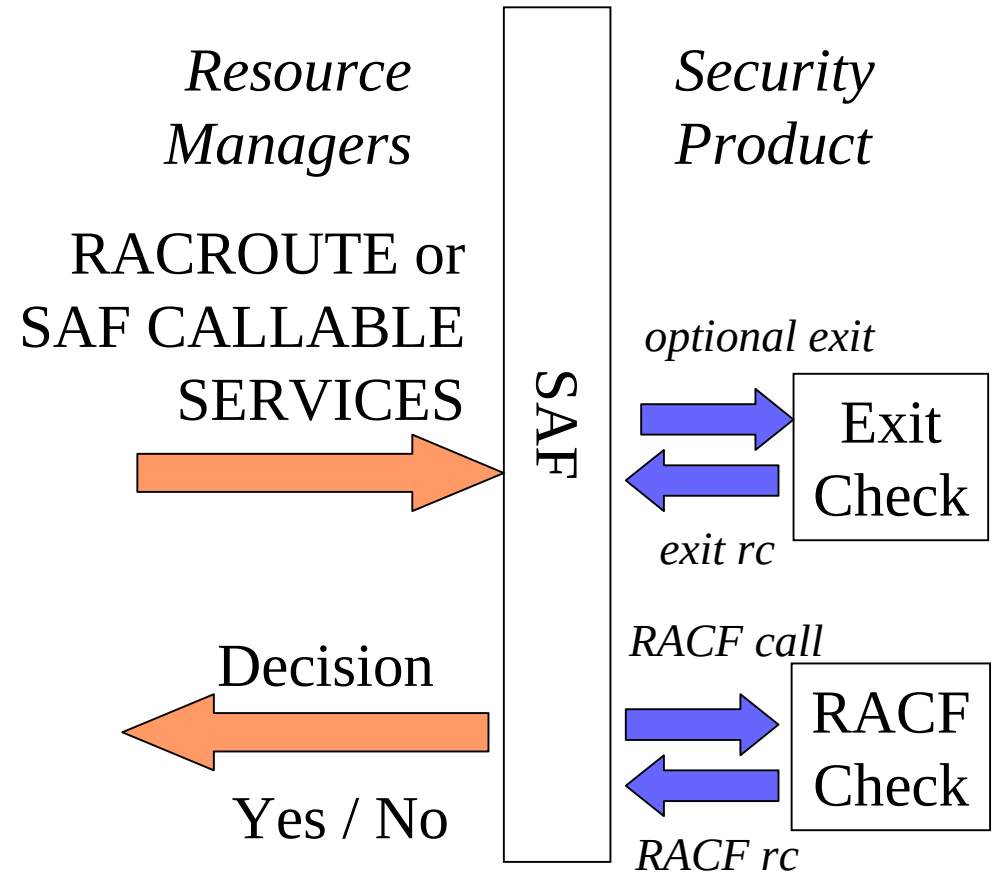
z/OS Security Server - RACF…

RACF is invoked by resources managers at control points, typically using SAF interfaces.

Examples of resource managers:

- UNIX System Services
- Contents Supervisor
- DFP (OPEN, SCRATCH)
- UTILITIES
- Catalog Management
- VSAM
- AMS
- DFSMS
- IMS
- CICS
- TSO
- DB2
- JES2 and JES3
- Console Services
- PSF
- VTAM
- SDSF
- Web sphere
- And more



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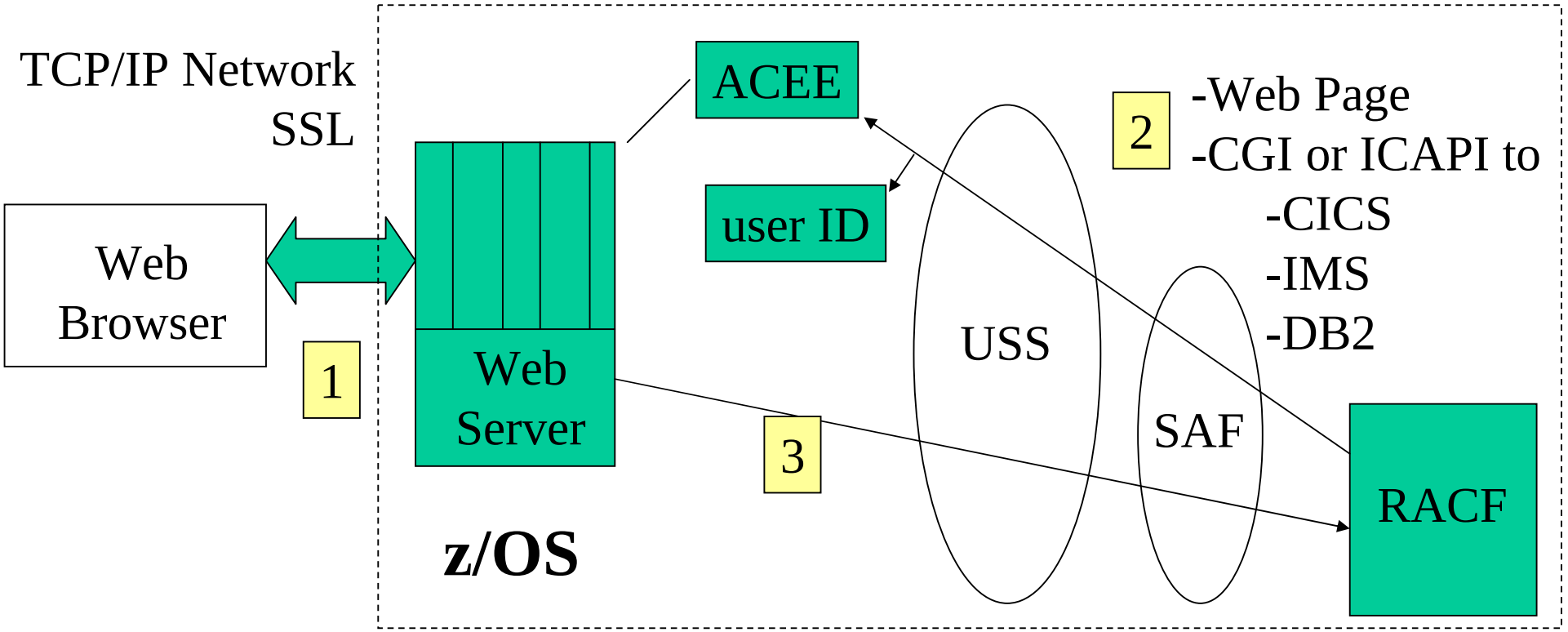
z/OS Security Server – RACF and Digital Certs



1. User authenticates to Secured Sockets Layer (SSL)
2. User requests z/OS secured resource via browser
3. Web Server invokes RACF via USS to build local security context (ACEE)

Passing SSL validated certificate instead of prompting for user ID and password!

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z/OS Security Server – RACF

- Digital certificates
  - Introduced in OS/390 R2.4
  - Basis for a complete certificate authority (CA) on z/OS
- Kerberos registry is RACF
- Unix System Services Security integrated with RACF with better security than other UNIX's
- Auditing of security events
- z/OS V1R5
  - Dynamic Templates
  - Multi-level security
  - Password Synchronization Solution
    - RACF, LDAP, and IDI

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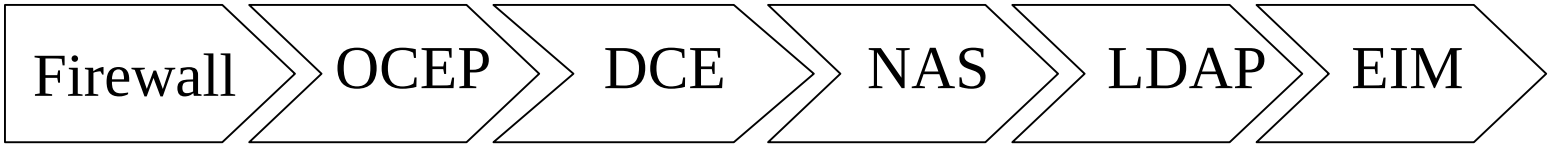
z/OS Security Server

z/OS Cryptographic Services

z/OS Integrated Security Services



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z/OS Cryptographic Services
Integrated Cryptographic Service Facility(ICSF)

Enciphering
Deciphering
Hashing
Generating digital signatures
Verifying digital signatures

Secret key and
public key cryptography

Callable services
Hardware store
Hardware assists

IBMs Common Cryptographic Architecture (CCA)
- Based on ANSI Data Encryption Algorithm (DEA)
-NIST Data Encryption Standard (DES)
- Advanced Encryption Standard (AES)
-Public Key Cryptography Standard (PKCS)
-SET Secure Electronic Transaction standard
-RSA Public key algorithm
-NIST Digital Signature Standard (DSS) algorithm

Keys
DES, triple DES
PINs
MACs
Card Verification Code (CVC)
SET applications
PKA encrypt/decrypt
Europay, MasterCard, Visa(EMV)
Integrated Circuit Card (ICC)

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z/OS Cryptographic Services – ICSF

- Designed for high security and high performance
  - Uses DES algorithms
  - Master keys stored in hardware
  - Cryptographic Coprocessors
  - Trusted Key Entry (TKE) workstation (optional)
    - Distributing master and operational keys
  - Callable services for use by applications
    - RACF can control access

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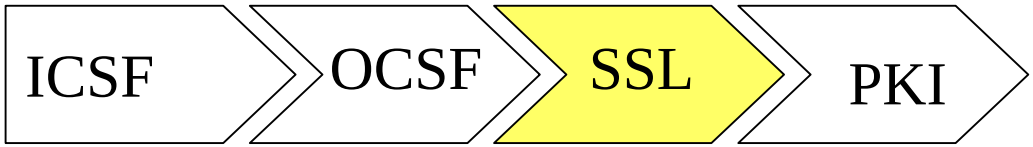
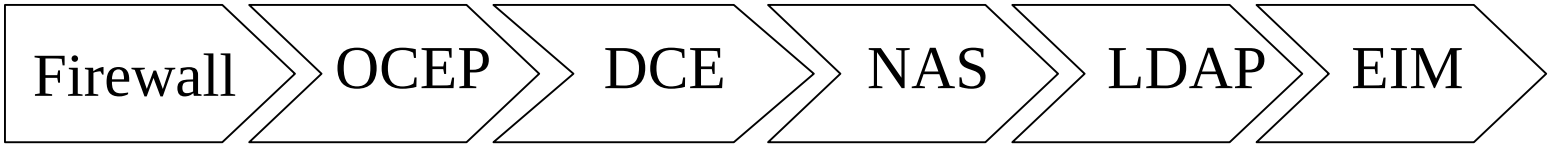
z/OS Security Server

z/OS Cryptographic Services



z/OS Integrated Security Services



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z/OS Cryptographic Services – System SSL

- SSL is a communications protocol for use by two applications communicating over an unsecured network
  - Ensures data privacy and integrity
  - Server and client authentication based on digital certificates
- Essential for secure transactions between web browser and web server
- System SSL gives the option of using RACF digital certificate support

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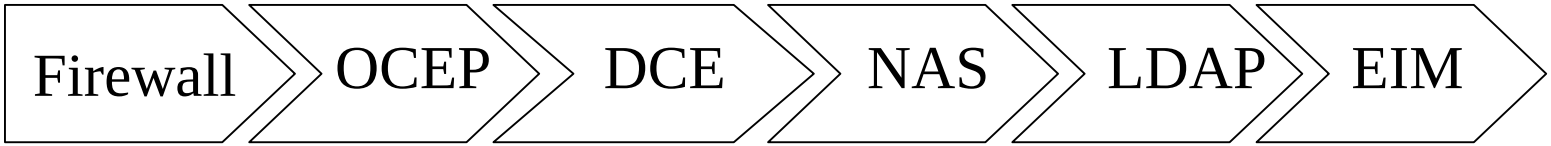
z/OS Security Server

z/OS Cryptographic Services

z/OS Integrated Security Services



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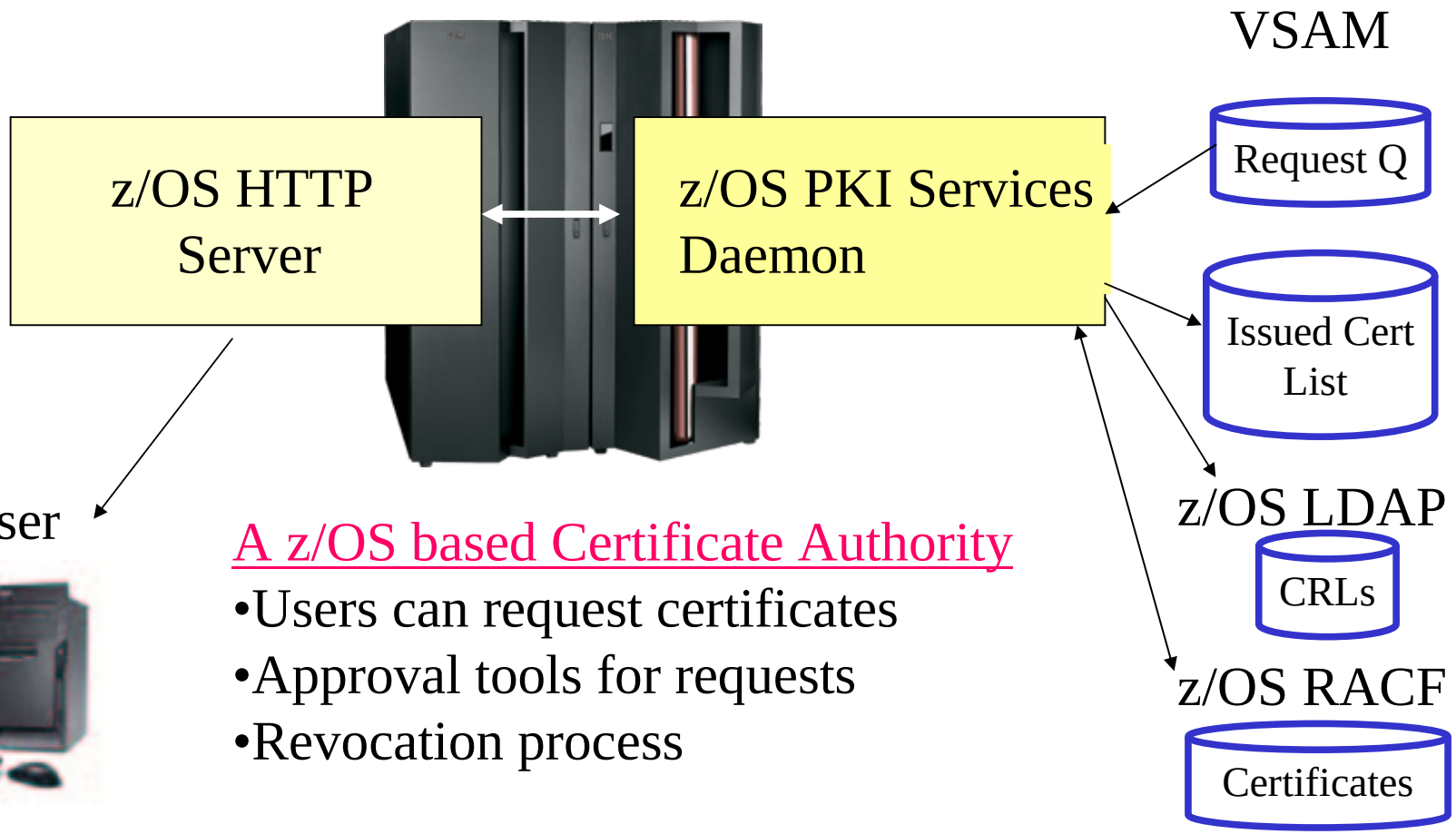
z/OS Cryptographic Services – PKI Services

PKI – Public Key Infrastructure Services



A z/OS based Certificate Authority

- Users can request certificates
- Approval tools for requests
- Revocation process

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z/OS Cryptographic Services – PKI Services

- Public Key Infrastructure (PKI) Services
- Complete certificate authority (CA) package
  - User request driven via customizable web pages
    - Browser or server certificates
  - Automatic or administrator approval process
    - Using same web pages
  - End user / administrator revocation process
- Closely coupled with PKI support in RACF

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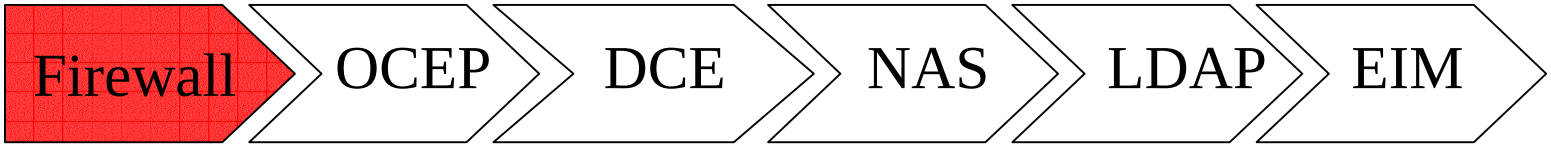
z/OS Cryptographic Services

z/OS Integrated Security Services



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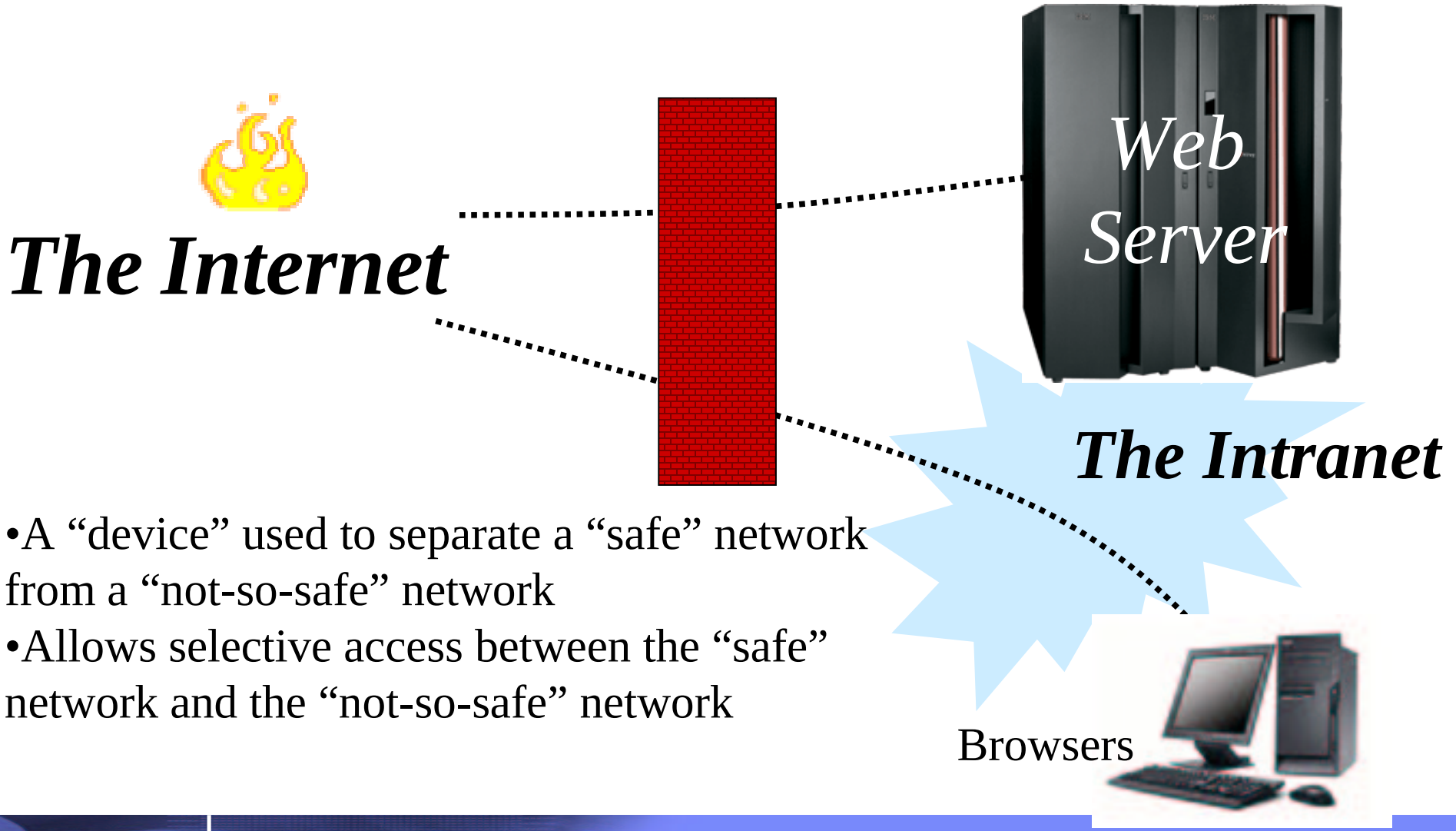
z/OS Integrated Security Services – Firewall



- A “device” used to separate a “safe” network from a “not-so-safe” network
- Allows selective access between the “safe” network and the “not-so-safe” network

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z/OS Integrated Security Services – Firewall Technologies

- Access Control
  - IP Packet Filter
  - FTP (Application Gateway) Proxy
  - SOCKS (Circuit Gateway) Server
  - Network Address Translation (NAT)
  - Virtual Private Networks (VPN)
  - Internet Key Exchange (Dynamic VPN)
- Management Logs and Reports
  - Monitor and Detect
  - Administration GUI

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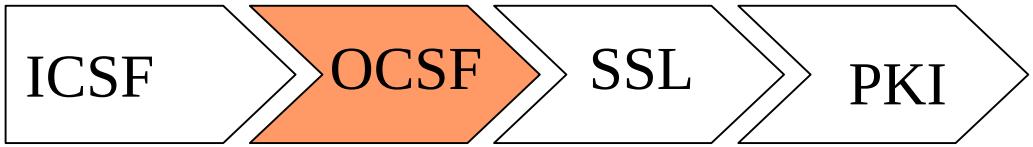
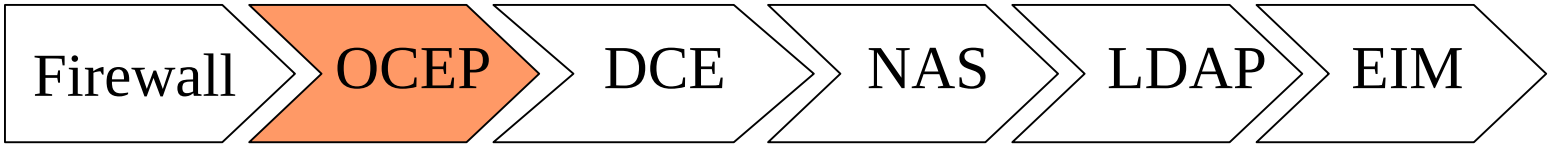
z/OS Security Server

z/OS Cryptographic Services



z/OS Integrated Security Services



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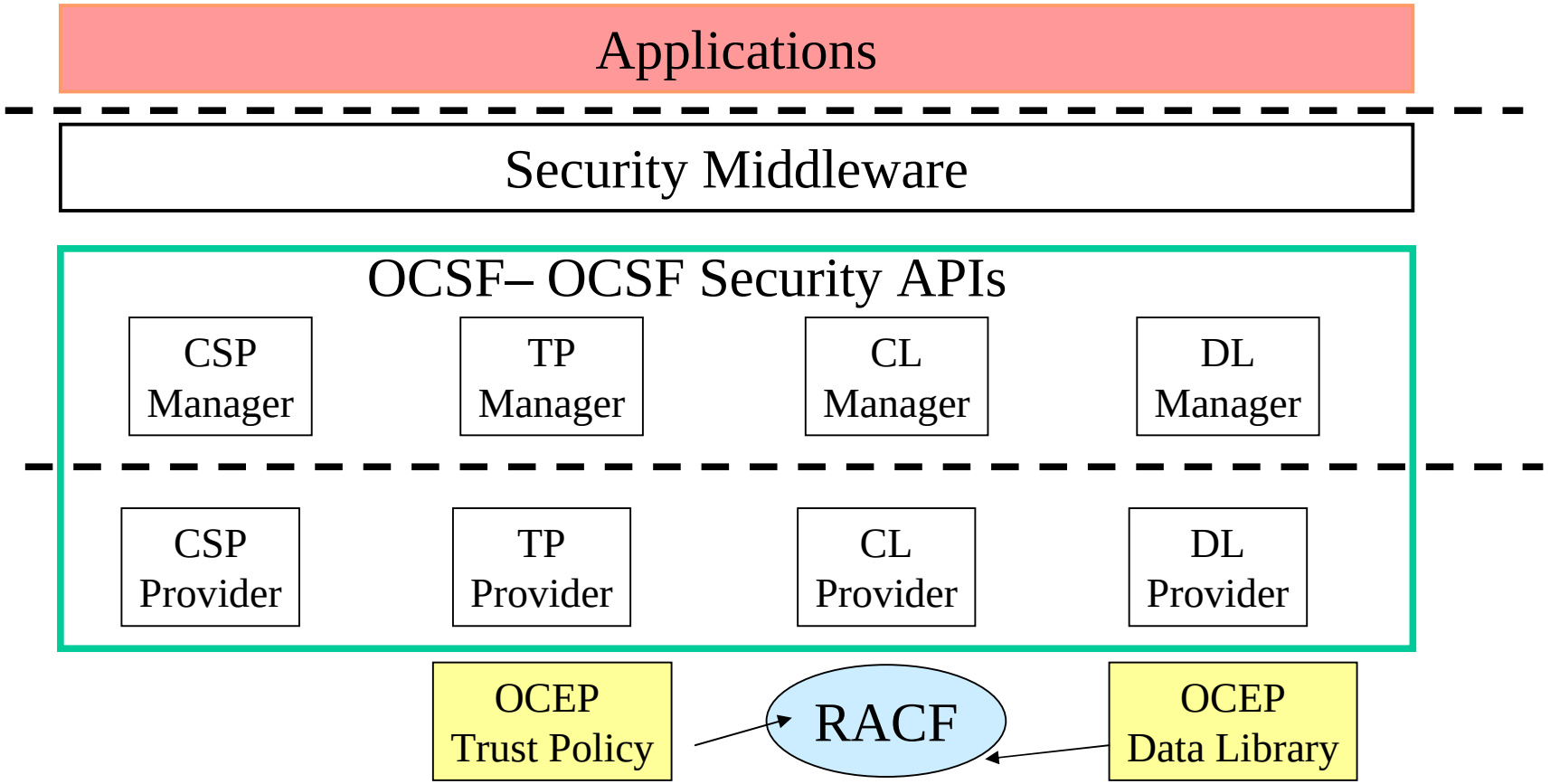
z/OS Integrated Security Services - OCEP

OCSF – Open Cryptographic Services Framework

OCEP – Open Cryptographic Enhanced Plug-in



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z/OS Integrated Security Services - OCEP

- OCSF
  - Common Data Security Architecture (CDSA)
    - IBM/Intel Security framework; X/Open Group standard
  - Unix APIs to utilize certificates and keys
- OCEP
  - Data Library Plug-In provides “read-only” access to RACF key rings
  - Trust Policy Plug-In verifies trustworthiness of a RACF key ring
    - Checks key rings
    - Certificates marked TRUST in RACF
- Solutions: Firewall, System SSL

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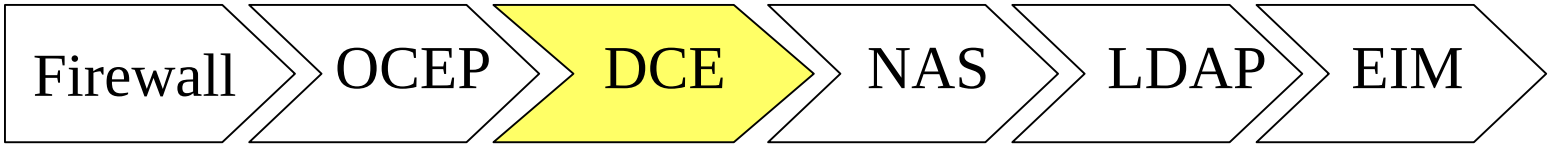
z/OS Cryptographic Services

z/OS Integrated Security Services



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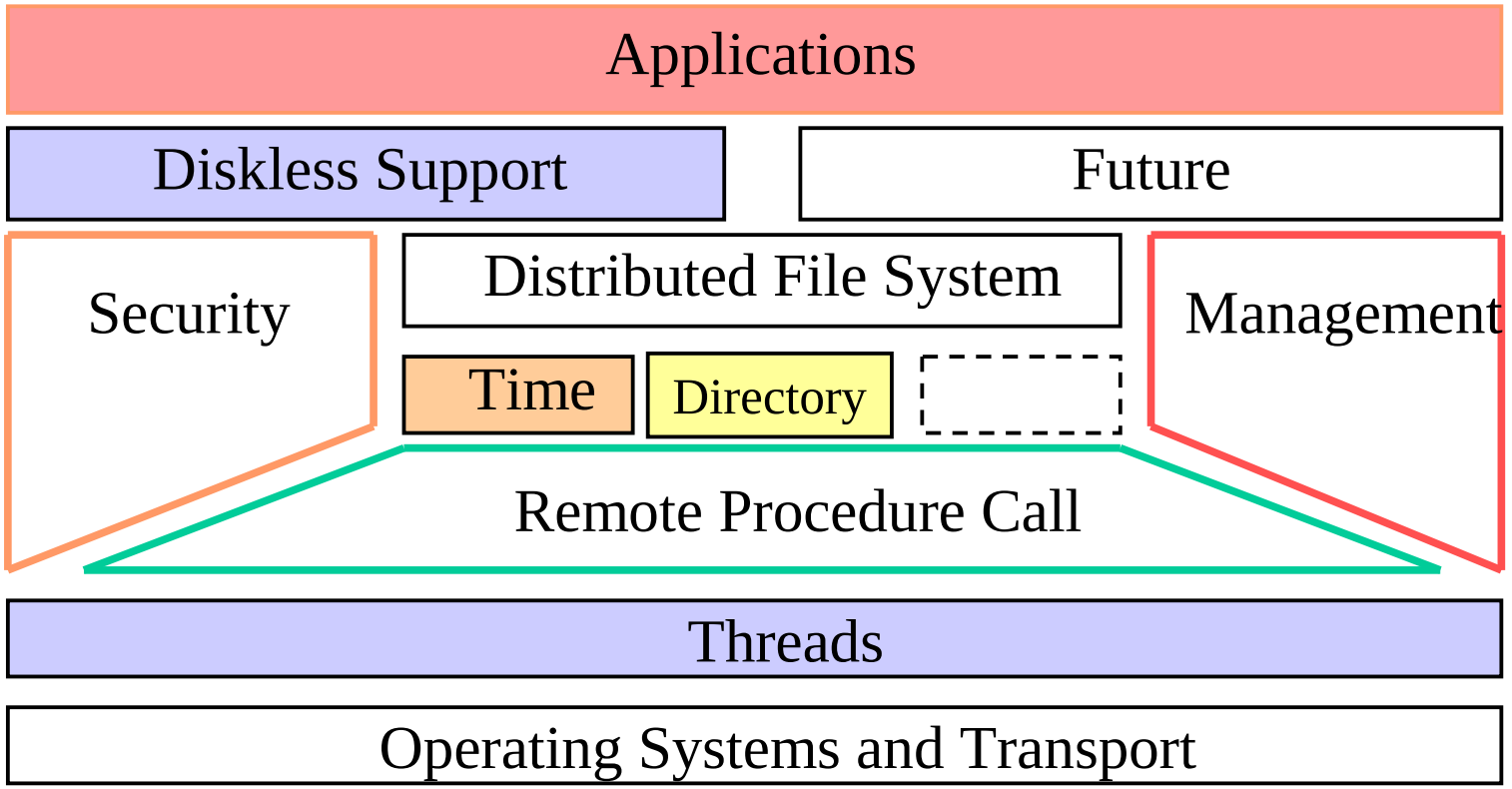
z/OS Integrated Security Services - DCE

DCE – Distributed Computing Environment



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z/OS Integrated Security Services - DCE

- Provides self contained environment and tools for developing and running applications on heterogeneous distributed systems
  - Remote Procedure Calls (RPCs)
  - Directory
  - Time
  - Security – Kerberos (not part of base)
  - Threading
- C++ not supported
- Supported by IBM, HP, SUN, DEC, Hitachi, others.

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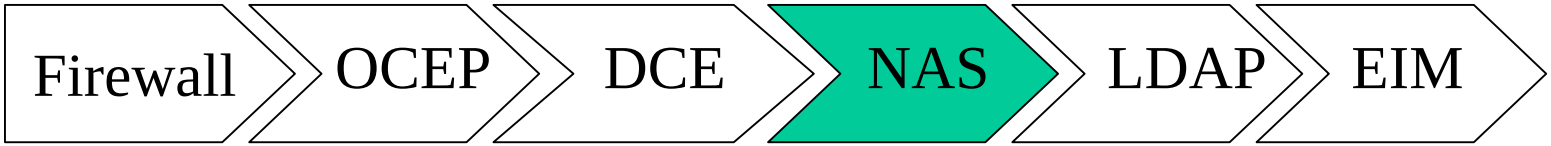
z/OS Security Server

z/OS Cryptographic Services

z/OS Integrated Security Services



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z/OS Integrated Security Services - NAS

NAS – Network Authentication Services

Kerberos (Cerberus) was the mythological three-headed dog that guarded the entrance to the underworld. Unless you could get past Kerberos, you could not enter (or leave!) the underworld).

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z/OS Integrated Security Services – Network Authentication Services (NAS)

realm

Key Distribution Center (KDC)

Authentication Server

Ticket Granting Server

AS
- Authenticates Users
- Grants TGTs

TGS
- Generates Session Keys
- Grants Service tickets based on TGTs

Ethel

RACF

Kerberos Registry

Realm A

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z/OS Integrated Security Services - NAS

- **Kerberos allows authentication over physically untrusted network**
  - Depends on a trusted third party – the KDC
- **Kerberos on z/OS**
  - Kerberos registry is integrated into RACF registry
  - Behaves like any other Kerberos “Realm”
  - Realm to realm function supported
  - Standards
    - RFC 1510 – Kerberos V5
    - RFC 1964 – GSS-API
- **Users**
  - Network based applications based on Kerberos authentication
  - IBM DB2 V7 and Web sphere V4

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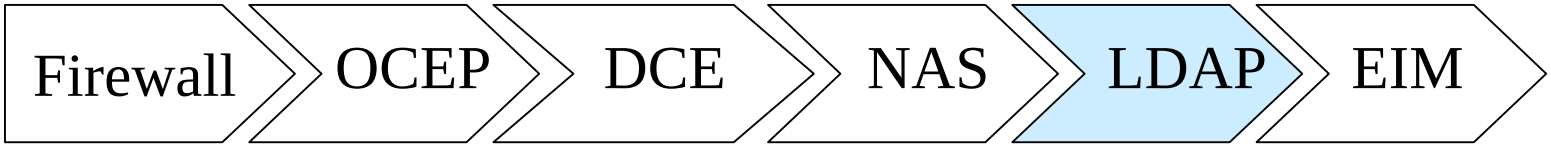
z/OS Security Server

z/OS Cryptographic Services

z/OS Integrated Security Services



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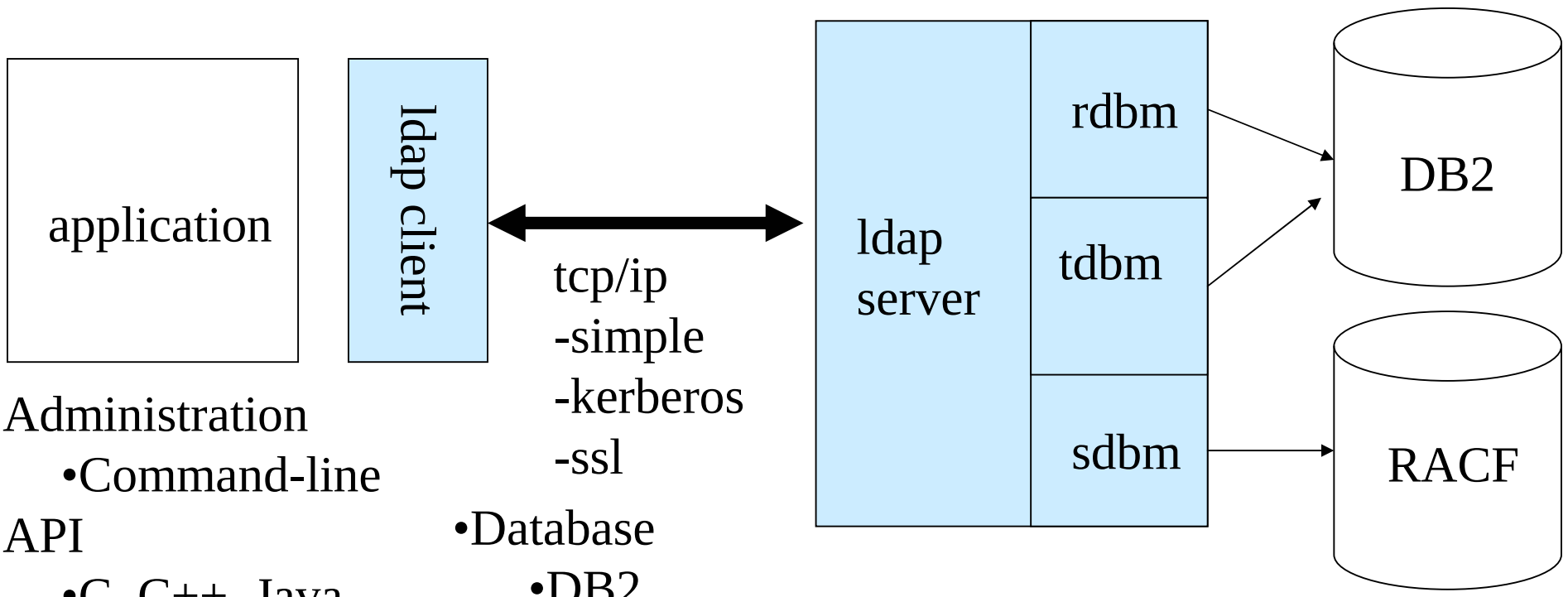
z/OS Integrated Security Services - LDAP

LDAP – Lightweight Directory Access Protocol



- Administration
  - Command-line
- API
  - C, C++, Java
- Protocol
  - LDAP V2 and V3
- Database
  - DB2
- Schema
  - Many elements common to other directories

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z/OS Integrated Security Services - LDAP

- What is a Directory Service?
  - A database that holds phone-book, location, configuration information
  - Optimized for frequent reads, infrequent updates
  - Based on IETF x.509 standards
- IBM Directory Products
  - z/OS Integrated Security Services LDAP
  - IBM Directory Server
  - IBM Tivoli Directory Server
  - Client APIs and Servers

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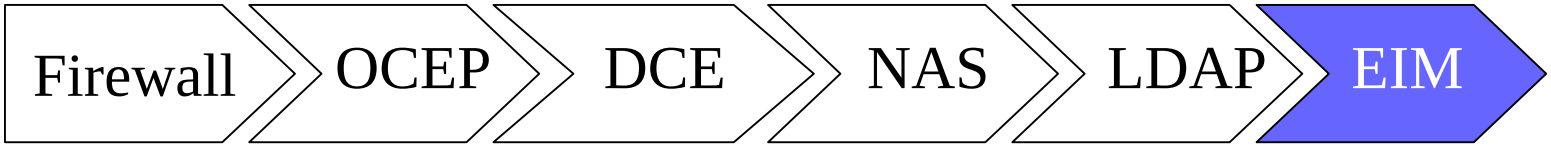
z/OS Security Server

z/OS Cryptographic Services

z/OS Integrated Security Services



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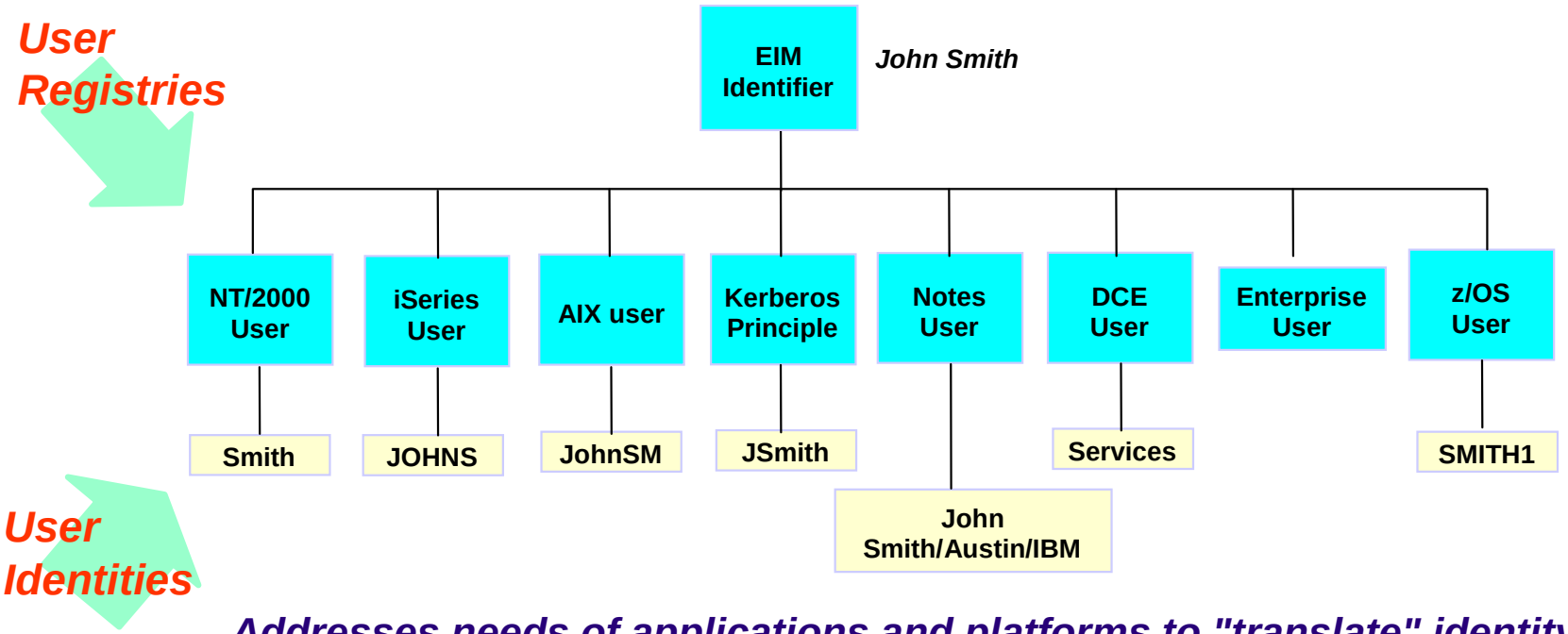
Enterprise Identity Mapping

- **EIM defines** associations between an identifier and user ids in registries that are part of OS platforms, applications, and middle-ware.
- The identity associations (*mappings*) are stored in a well known location, e.g. LDAP, with common services across platforms to access the mappings.



Addresses needs of applications and platforms to "translate" identity when crossing platform and registry boundaries.

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z/OS Integrated Security Services - EIM

- Addresses needs of applications and platforms to "translate" identity when crossing platform and registry boundaries.
- Middleware infrastructure
- Available on iSeries, pSeries, xSeries, zSeries
- Complementary to Tivoli Identity Manager

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Session Summary

The optional features

Security Server

RACF

The base elements

Cryptographic Services

ICSF, OCSF, PKI Services, System SSL

Integrated Security Services

DCE, EIM, Firewall Technologies, LDAP,
Network Authentication Services (i.e. Kerberos), OCEP

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