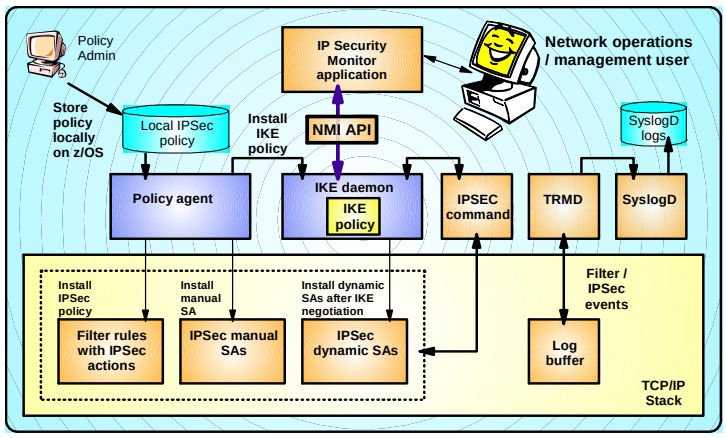

This presentation discusses the security enhancements in z/OS V1R9 Communications Server.

# IP Security network management interface (NMI)

- In z/OS V1R7, IP security network management data was made available with a UNIX® shell command (the ipsec command)
- Adding a formalized network management programming interface to retrieve IP security management data, enables a network management application, such as IBM Tivoli OMEGAMON® to access IP Security management data and integrate such data into the network management functions OMEGAMON already provide




Data similar to what can be retrieved using the ipsec command will be available over the IP Security NMI interface:

- IP filtering rules and statistics
- IKE Phase I SA information and status
- IKE Phase 2 SA information and status
- Manual SA information and status
- Port translation data

IBM Tivoli's OMEGAMON for Mainframe Network product is expected to utilize this interface.




In z/OS V1R7 Communications Server, IP security network management data was made available with a UNIX shell command (the ipsec command). Adding a formalized network management programming interface to retrieve IP security management data, enables a network management application to access IP Security management data and integrate such data into the network management functions already provided.

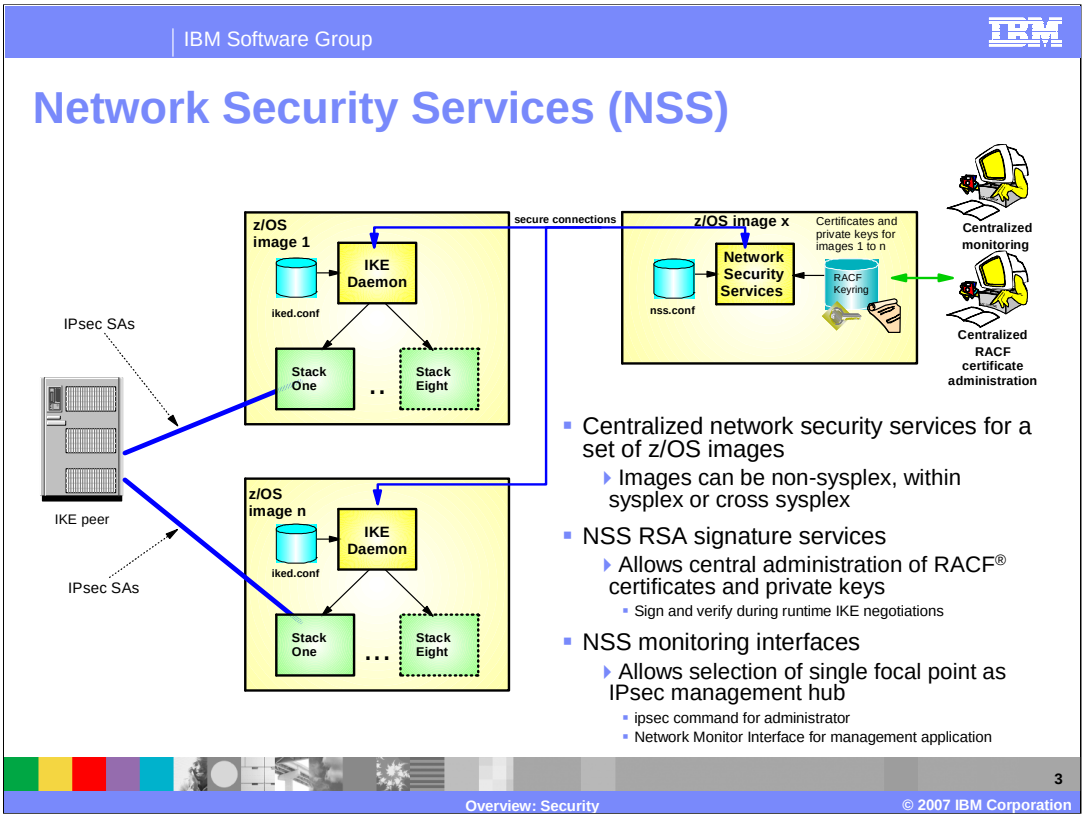
The ipsec command displays and manages system information for Integrated IPSec, but a programmatic interface was needed for network management applications to perform these actions without needing to resort to screen-scraping.

A network management interface is implemented for Integrated IPSec in z/OS V1R9 Communications Server. The IKE daemon implements an AF_UNIX listening socket that accepts connections, and uses a request/response model for providing IPSec management data and control. Consequently, IKED must be running in order to make use of this service. Data similar to what can be retrieved using the ipsec command will be available over the IP Security NMI interface:

- •IP filtering rules and statistics
- •IKE Phase I Security Association information and status
- •IKE Phase 2 Security Association information and status
- •Manual Security Association information and status
- •Port translation data

In addition the interface allows for the following:

- •Activation or deactivation of manual tunnels
- •Activation, deactivation, or refresh of IP tunnels
- •Deactivation or refresh of IKE tunnels
- •Load default IP filters or policy IP filters




Network Security Services (NSS) centralizes the sensitive keying material that would otherwise need to reside in less secure zones of the network onto a single location in the most secure zone of the network. In addition, NSS allows for centralized configuration and administration of certificates.

Network Security Services provide centralized certificate services, monitoring and management for IPSec security across z/OS systems within and across sysplexes. Network Security Services allow IPSec certificates to be kept in a single location, rather than having them reside on each z/OS node. The z/OS Communications Server IKE daemon is enhanced so that it can be configured to act as a Network Security client. Configuration is on a per-stack basis, such that each NSS-enabled stack will appear to the Network Security Server as an independent client. For TCP/IP stacks that are not configured to use Network Security Services, the IKE daemon will continue to manage certificates out of a local keyring.

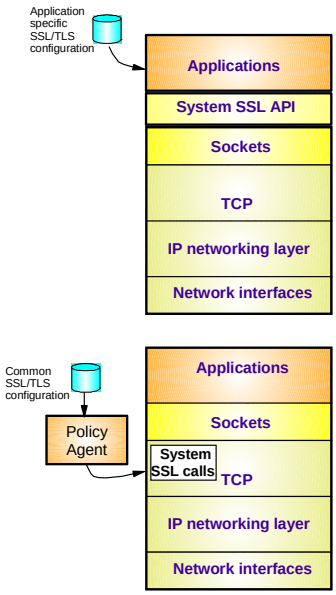
Specifically, NSS provides a central SAF-enabled repository for RSA certificates along with signature services within the most trusted zones. It eliminates the need to distribute certificates to security endpoints. NSS centralizes and reduce configuration and deployment complexity, especially when used along with Centralized Policy Services. It offloads digital signature operations from IKE daemon (the NSS client) and it enables monitoring and management of remote IPSec endpoints through the ipsec command and a network management programming interface.

The network security services (NSS) server provides a set of network security services for IPSec. These include the certificate (and digital signature) service and the network management service. The certificate service and network management service are used by NSS clients. When an NSS client uses the NSS certificate service, the NSS server creates and verifies RSA signatures on the behalf of the NSS client using RSA certificates that are stored only at the NSS server. When an NSS client uses the network management service, the NSS server routes IPSec network management interface (NMI) requests to that NSS client, which enables the NSS client to be managed remotely. The NSS client provides the NSS server with responses to these requests.

As mention earlier, the IKE daemon can be configured to act as an NSS client on behalf of multiple TCP/IP stacks. A separate connection is maintained to the server for each NSS-enabled TCP/IP stack, so each TCP/IP stack appears as a separate NSS client to the NSS server. The -z option of the ipsec command or the IPSec NMI can be used to manage NSS clients that use the NSS network management service. For details about using the ipsec command to manage NSS clients, see *z/OS Communications Server: IP System Administrator's Commands*. For details about using the IPSec NMI to manage NSS clients, see *z/OS Communications Server: IP Programmer's Guide and Reference*.

# AT-TLS API enhancements

- SSL/TLS support can since z/OS V1R7 be implemented using one of two methods on z/OS:
  - Change applications that need SSL/TLS security to support SSL/TLS configuration and invoke system SSL directly.
  - Let the Application-Transparent TLS (AT-TLS) layer inside the TCP/IP stack handle all SSL/TLS processing
- Using AT-TLS has several advantages:
  - AT-TLS provides SSL/TLS features above and beyond what most SSL/TLS applications choose to support
  - Support of new SSL/TLS functions, such as new ciphersuites, can be added without application changes
- Enhancements to the AT-TLS API
  - Stop security on a connection
  - Allow both secure and non-secure connections to the same port







SSL/TLS support can, since z/OS V1R7. be implemented using one of two methods on z/OS:

•Change applications that need SSL/TLS security to support appropriate application-specific configuration options to specify SSL/TLS options, such as keyring, cipher suites, application-specific security options, and so on. Replace selected socket calls with calls to system SSL (C/C++/Java only)

•Let the Application-Transparent TLS layer inside the TCP/IP stack handle all SSL/TLS processing. This method provides common SSL/TLS configuration for all applications through an AT-TLS policy (managed by the Policy agent). It uses optimized SSL/TLS code within the TCP/IP stack that interfaces to system SSL to implement the SSL/TLS functions. In many cases SSL/TLS support can be added without application changes

Using AT-TLS has several advantages:

•AT-TLS provides SSL/TLS features above and beyond what most SSL/TLS applications choose to support - such as, support for Certificate Revocation Lists (CRLs), multiple keyrings per server, optional use of system SSL cache, and so on.

•AT-TLS uses an optimized SSL/TLS infrastructure that performs better than when SSL/TLS is implemented directly in the applications.

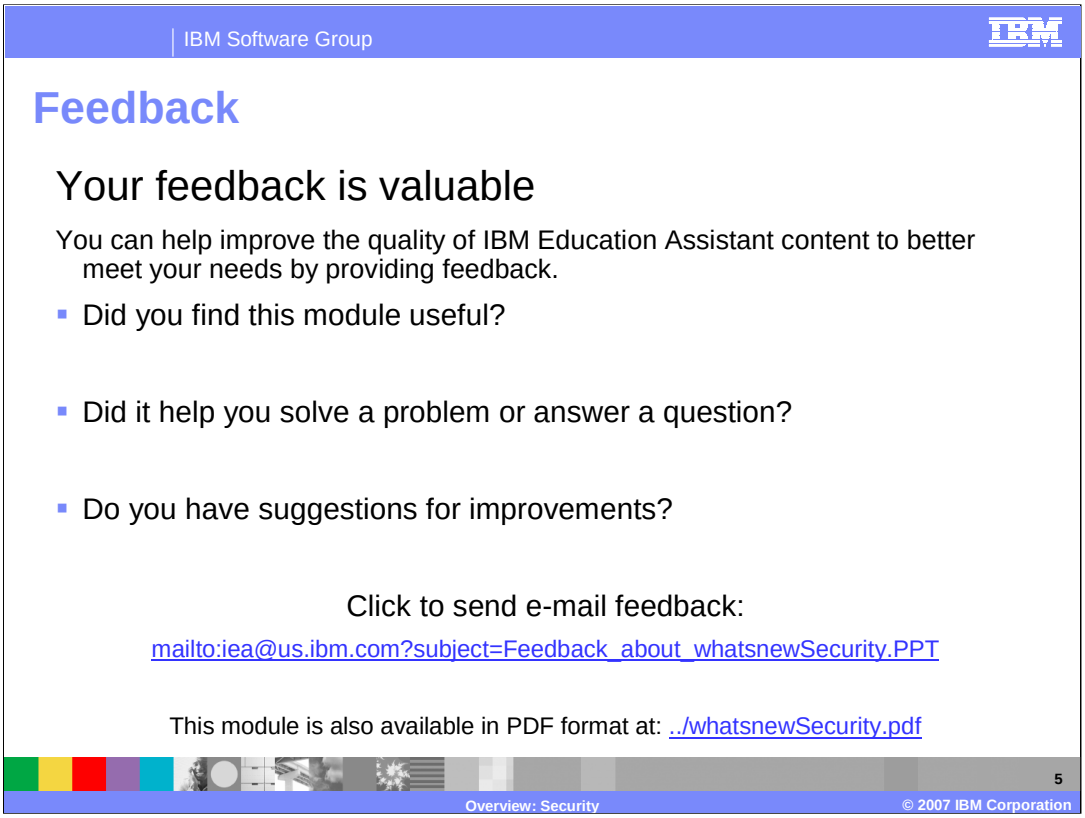
•Support of new SSL/TLS functions, such as new ciphersuites, can be added without application changes.

•Allows SSL/TLS-enabling non-C sockets applications on z/OS, such as CICS Sockets, Assembler- and Callable sockets, and so on.

z/OS 1.7 introduced Application Transparent Transport Layer Security (AT-TLS) and the SIOCTTLSCTL IOCTL. This allowed applications to control AT-TLS security on a connection. The application starts security on the connection. The application can also reset the cipher being used to generate new session keys for the connection or reset the session associated with the connection to force a full SSL handshake. This type of application is called a controlling application. The AT-TLS policy must be defined with ApplicationControlled On.

Many applications use a secure connection for sensitive data during the connection. After this data exchange, security is no longer needed for the connection. The application will stop security on the connection, reducing the CPU overhead of security. Some applications also support both secure and non-secure connections on the same port. These applications detect which type of client has connected and act accordingly. These type of applications could not use the SIOCTTLSCTL ioctl to implement security.

Two new options now are defined for the SIOCTTLSCTL ioctl. TTLS_Stop_Connection allows the application to stop security on a connection. The SSL security on the connection will be stopped and future data will be sent as clear text. TTLS_Allow_HSTimeout will allow the SSL handshake to timeout if no SSL data is received from the client or if clear text data is received. This option is only valid with TTLS_Init_Connection since it only applies to a SSL handshake on a clear text connection.

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