z/OS Communications Server – Performance overview
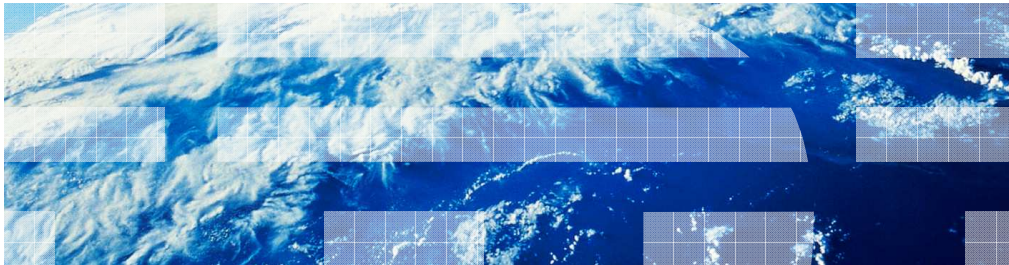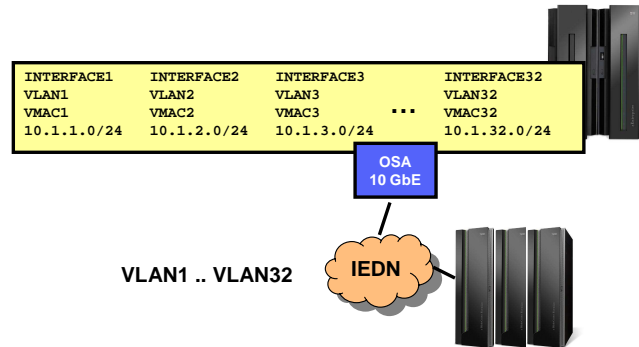
This presentation provides an overview of the new functions in z/OS V1R13 Communications Server for performance improvements.

Enhanced support for OSA VLANs

- In z/OS V1R10, Communications Server added multiple VLAN support
  - Up to eight IPv4 and eight IPv6 VLANs per OSA port
- Raise limit from eight to 32 VLANs per stack per OSA port
  - No impact to OSA
  - VLANs used for network isolation in the zEnterprise IEDN

```
INTERFACE1    INTERFACE2    INTERFACE3         INTERFACE32
VLAN1         VLAN2         VLAN3              VLAN32
VMAC1         VMAC2         VMAC3       ...    VMAC32
10.1.1.0/24   10.1.2.0/24   10.1.3.0/24       10.1.32.0/24
```

OSA 10 GbE

VLAN1 .. VLAN32   IEDN

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In z/OS V1R10, Communications Server added multiple VLAN support. Up to eight IPv4 and eight IPv6 VLANs are allowed per OSA port. A separate INTERFACE statement and data device are required per VLAN. The value of eight is a z/OS Communications Server software limitation. In z/OS V1R13, the limit is raised to 32 VLANs per stack per OSA port. There is no impact to OSA. This enhancement is in support of the emphasis on VLANs for network isolation in the zEnterprise IEDN.

64-bit exploitation

- Traces relocated to 64 bit common storage
  - VTAM internal trace (VIT) moved from ECSA and data space to 64 bit common
  - Multiple CTRACE components moved from data spaces to 64 bit common

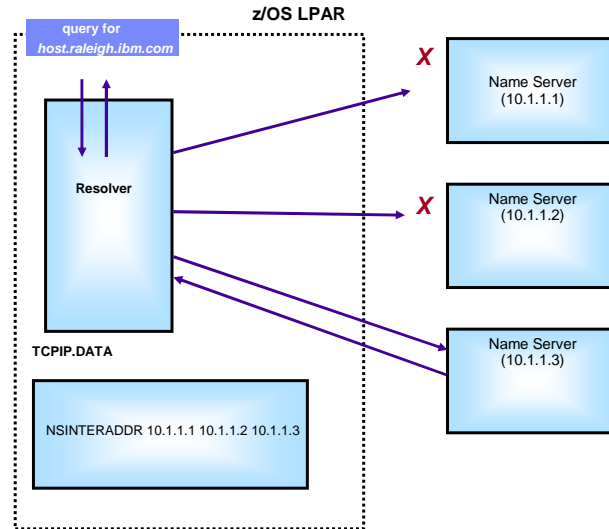| CTRACE Component	Current location	z/OS V1R13 change	User
SYSTCPIP	TCPIPDS1 Dataspace	64 bit common	Stack
SYSTCPIP	TN3270E Private storage	64 bit private	TN3270E
SYSTCPDA	TCPIPDS1 Dataspace	64 bit common	Stack (NMI)
SYSTCPIS	TCPIPDS1 Dataspace	64 bit common	Stack
SYSTCPCN	TCPIPDS1 Dataspace	64 bit common	Stack (NMI only)
SYSTCPSM	TCPIPDS1 Dataspace	64 bit common	Stack (NMI only)
SYSTCPRE	Private SP229	No Change	RESOLVER
SYSTCPRT	OMPROUTE Private storage	No Change	OMPROUTE
SYSTCPIK	IKE daemon Private storage	No Change	IKESMP
SYSTCPOT	TCPIPDS1 Dataspace	64 bit common	OSAENTA
SYSTCPNS	NSS daemon's private storage	No Change	Security Server

In z/OS V1R13 Communications Server, multiple trace buffers have been relocated to take advantage of 64 bit common storage. The VTAM internal trace (VIT) is moved from ECSA to 64 bit common storage. In addition, the data space VIT is no longer used. This move is transparent to you if you use the external VIT to obtain trace records.

For TCP/IP, multiple CTRACE components are moved from data spaces to 64 bit common storage. The table summarizes the changes. These moves are transparent to you as long as you use the NMI interface to obtain trace data.

Resolver autonomics for unresponsive name servers

- z/OS V1R12, resolver monitors name servers for responsiveness to queries
  - Network operator notification
  - New queries still sent to unresponsive name servers
  - No configuration required
- z/OS V1R13, can stop sending queries to unresponsive name servers
  - Network operator notification
  - Polls unresponsive name server to detect when responsive again
 - Configuration required

query for *host.raleigh.ibm.com*

z/OS LPAR

Resolver

TCPIP.DATA

NSINTERADDR 10.1.1.1 10.1.1.2 10.1.1.3

Name Server (10.1.1.1)

Name Server (10.1.1.2)

Name Server (10.1.1.3)

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In z/OS V1R12, the resolver monitors name servers for responsiveness to queries. The network operator receives a notification when a name server becomes unresponsive. Although the resolver detects the unresponsive name server, new queries are still sent to that name server. This function is enabled by default.

In z/OS V1R13, the resolver can be configured to stop sending queries to unresponsive name servers. The resolver polls the unresponsive name server to detect when it becomes responsive again. The operator is notified of the condition using messages similar to those used in V1R12. The autonomic quiescing function must be explicitly enabled in the resolver setup file.

Miscellaneous TCP/IP performance improvements

- Communications Server improves performance and throughput in every release by focusing on software path length

- Goal is 5% performance improvement in TCP/IP per release

- Examples of improvements for z/OS V1R13:
  - Increased use of compiler optimization
  - Modified layout of internal data structures for better caching
  - Use of separate IPv4 and IPv6 modules
  - Improved TN3270 performance for long data streams (> 90 bytes)

Throughput

Cost

Performance overview
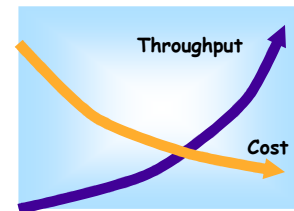
Communications Server development strives to improve performance and throughput in every release by focusing on software path length. The goal is at least a 5% performance improvement in TCP/IP per release. Some of the improvements for z/OS V1R13 are listed above.

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