

Accelerero™ Diameter Agent – An Overview



*accelerating network and
application convergence*

- ▶ Accelero Diameter Agent Overview
- ▶ Accelero Diameter Agent – Product Features

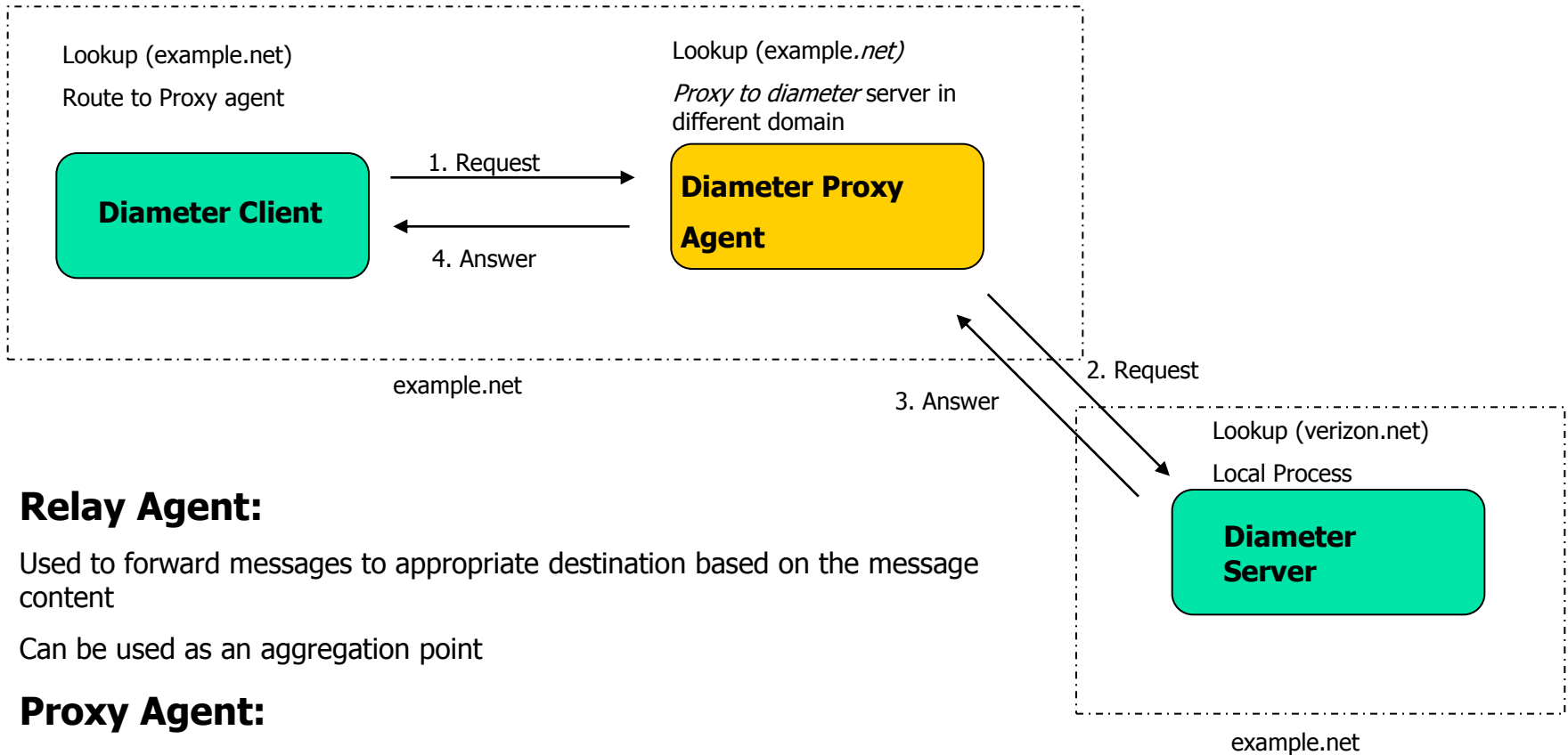


Role of Diameter Agents in LTE networks



*accelerating network and
application convergence*

The Diameter Proxy Agent - Definitions



Relay Agent:

Used to forward messages to appropriate destination based on the message content

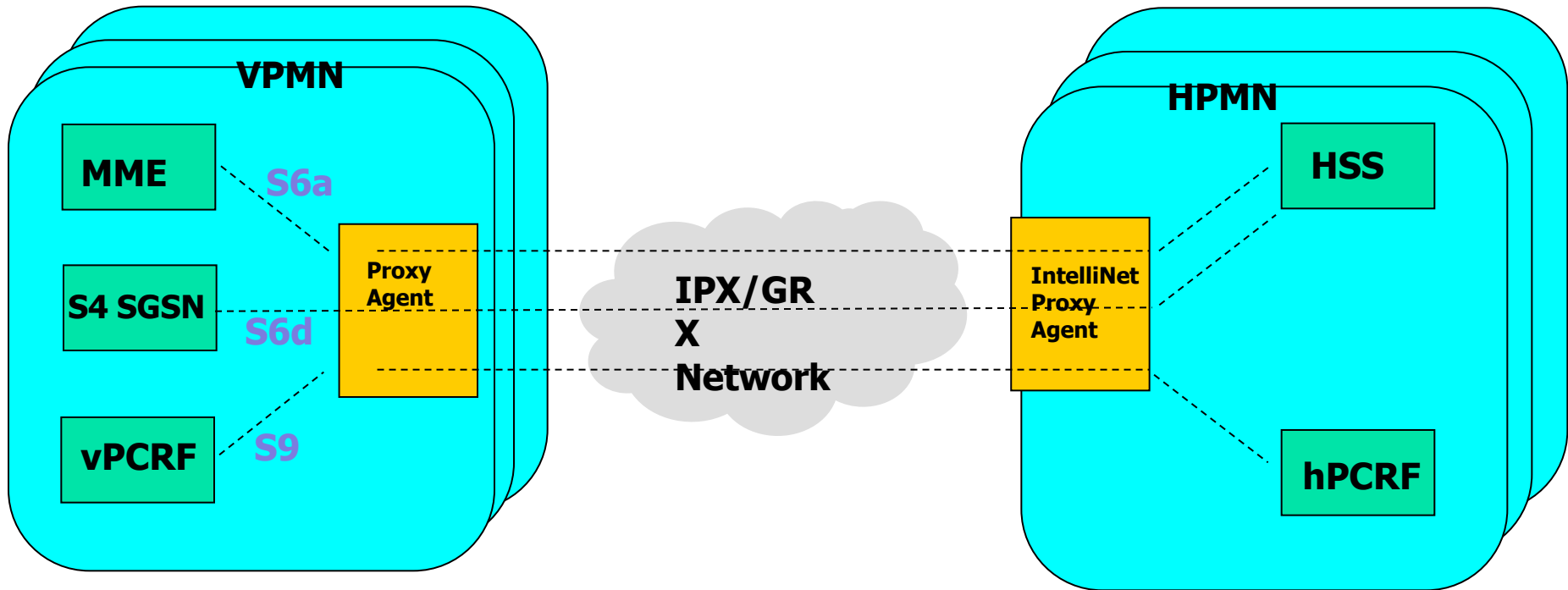
Can be used as an aggregation point

Proxy Agent:

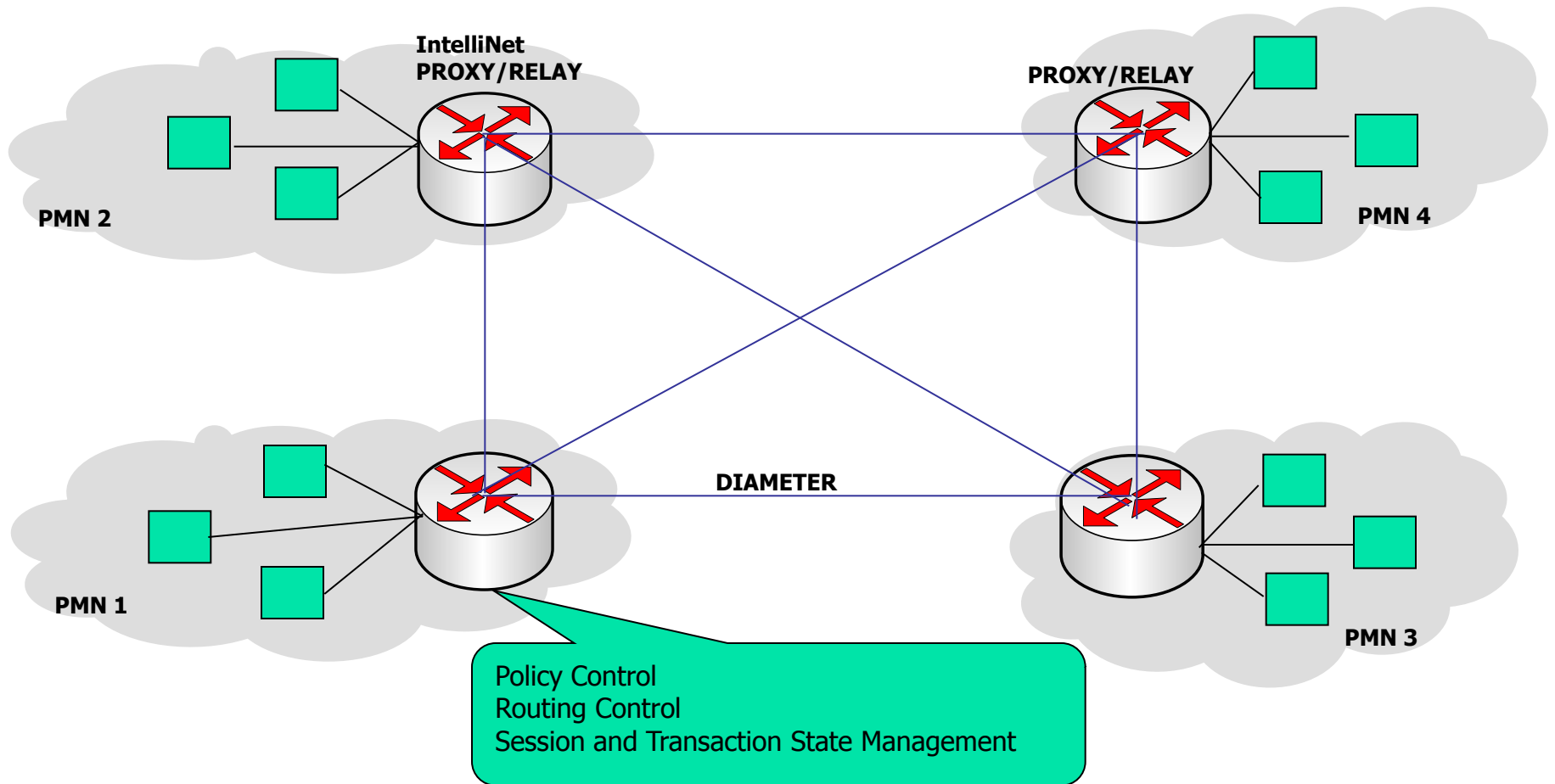
Similar to a relay agent + can modify message content.

Can enforce access rules, policy specific rules (dependent on each application)

3GPP – LTE Roaming Architecture – Role of Diameter Proxy/Relay Agents



LTE – Diameter Relay/Proxy Hub Network Design



Accelerero Diameter Agent Overview



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Accelero Diameter Agent – Hardware Platforms



Carrier Grade Netra X4270 Platform



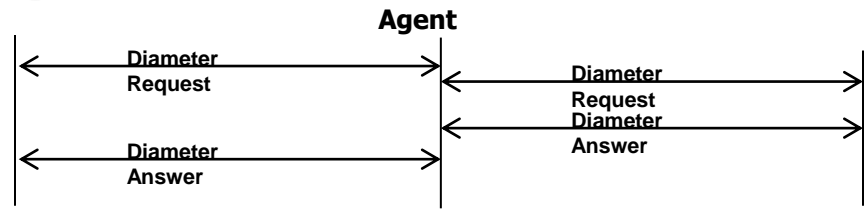
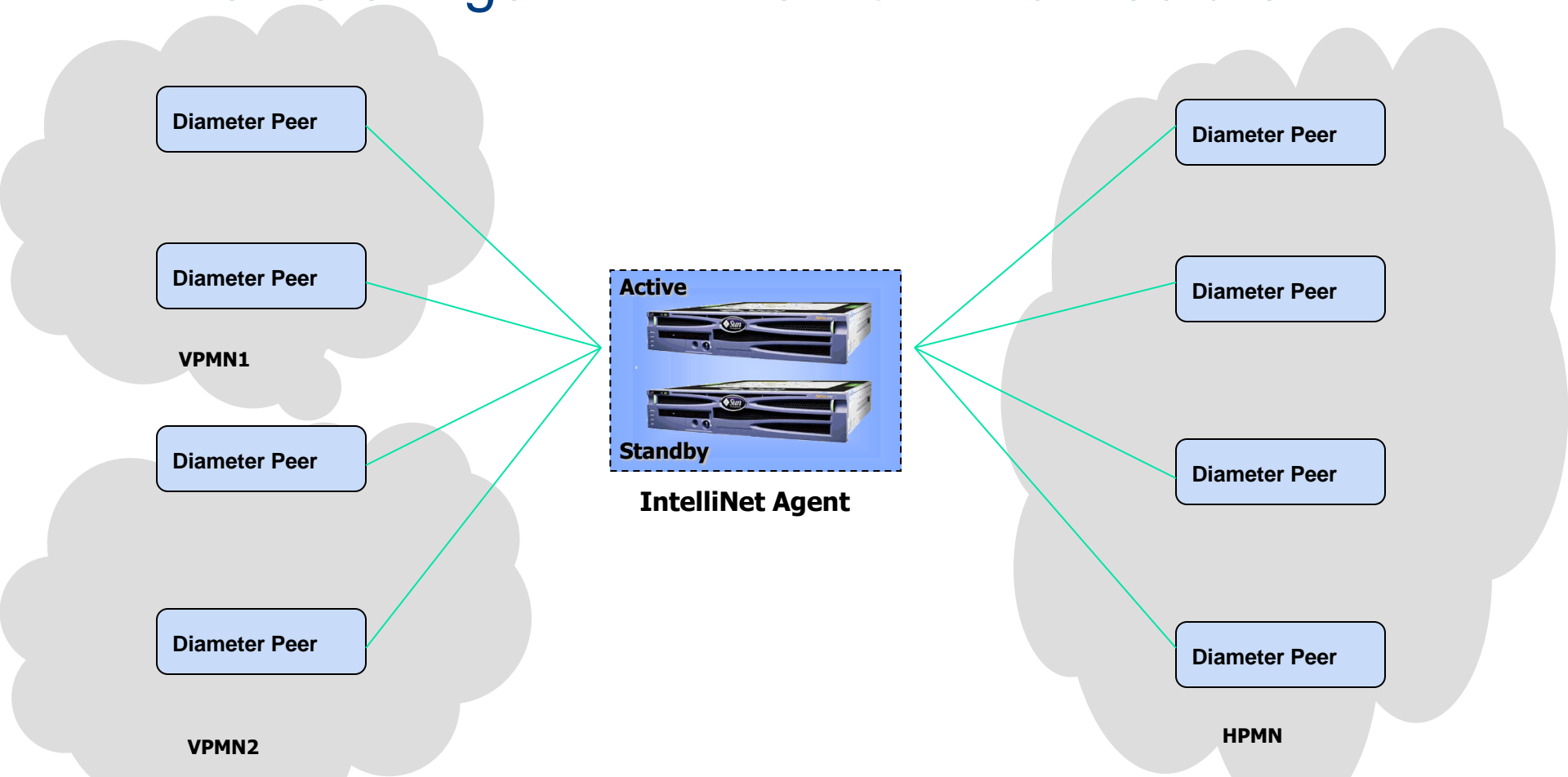
Carrier Grade Netra T5220 Platform



IBM eServer xSeries

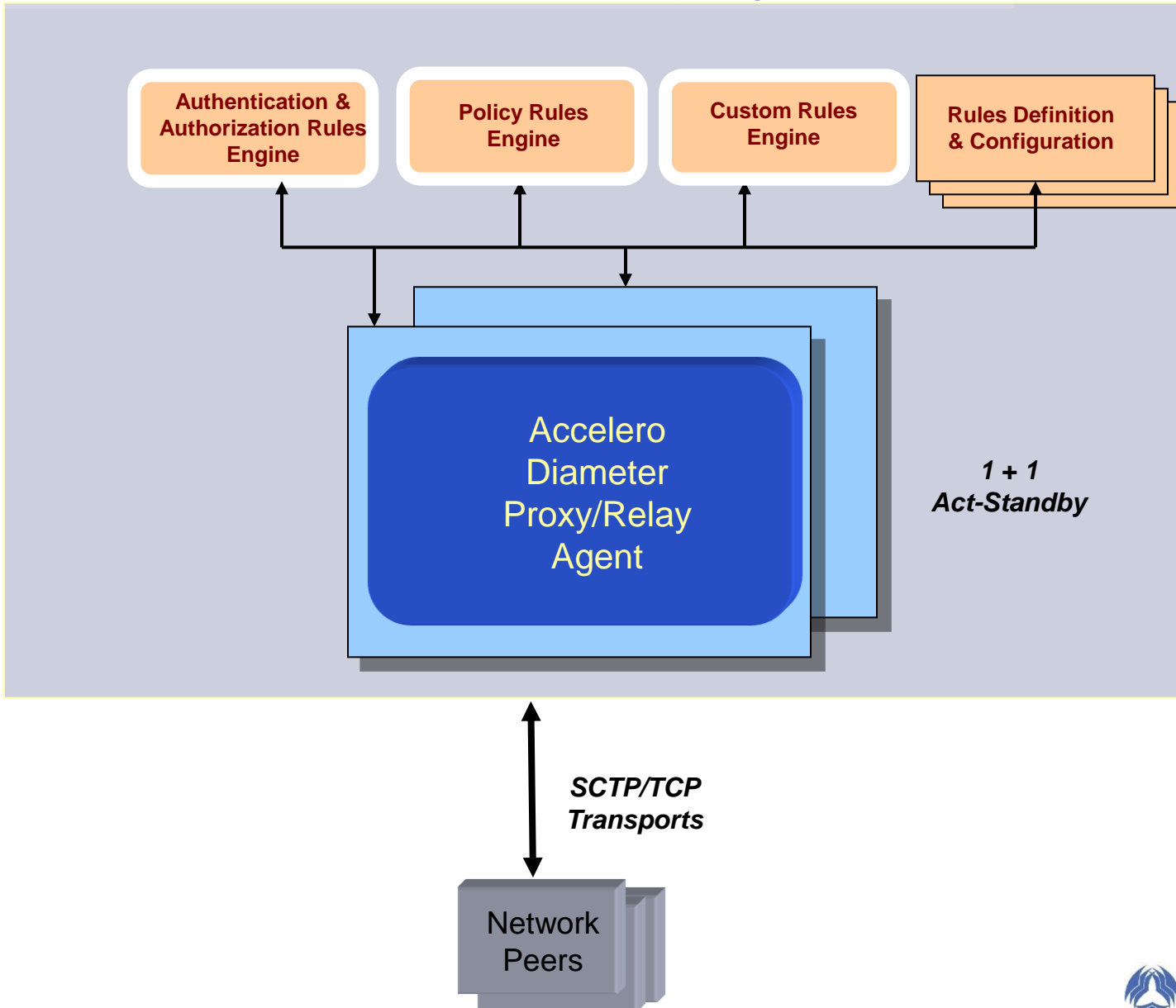
| Server | X4270 | T5220 | IBM xServer |
|------------------|--|--|----------------|
| Processor | 1 Quad-Core Intel Xeon, 2.13 GHz (4 cores – expandable to 8) | 4 core 1.2 GHz T2 Expandable to 8 cores | Dual Xeon 3GHz |
| Memory | 4 GB | 8 GB | 1 GB |
| Operating System | Linux/Solaris | Solaris | Linux |

Diameter Agent LTE Network Architecture

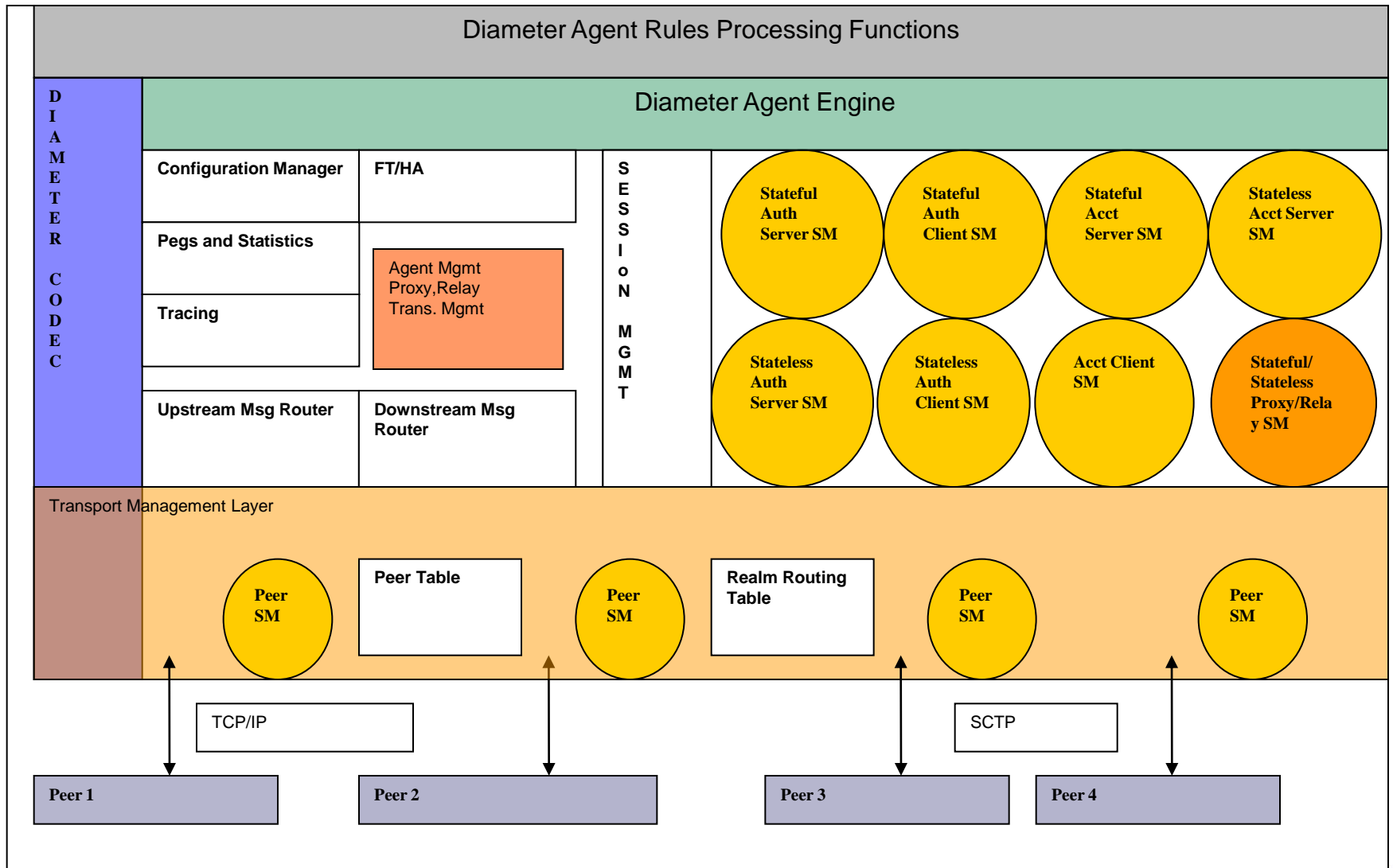


Product Features

The Accelero Diameter Proxy Agent

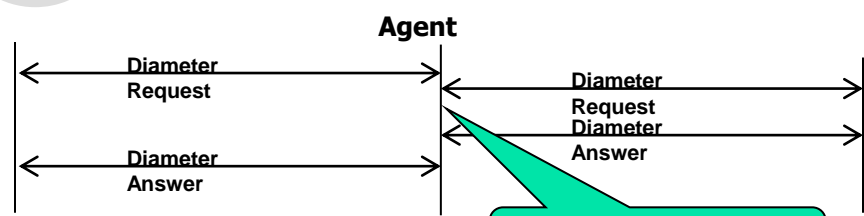
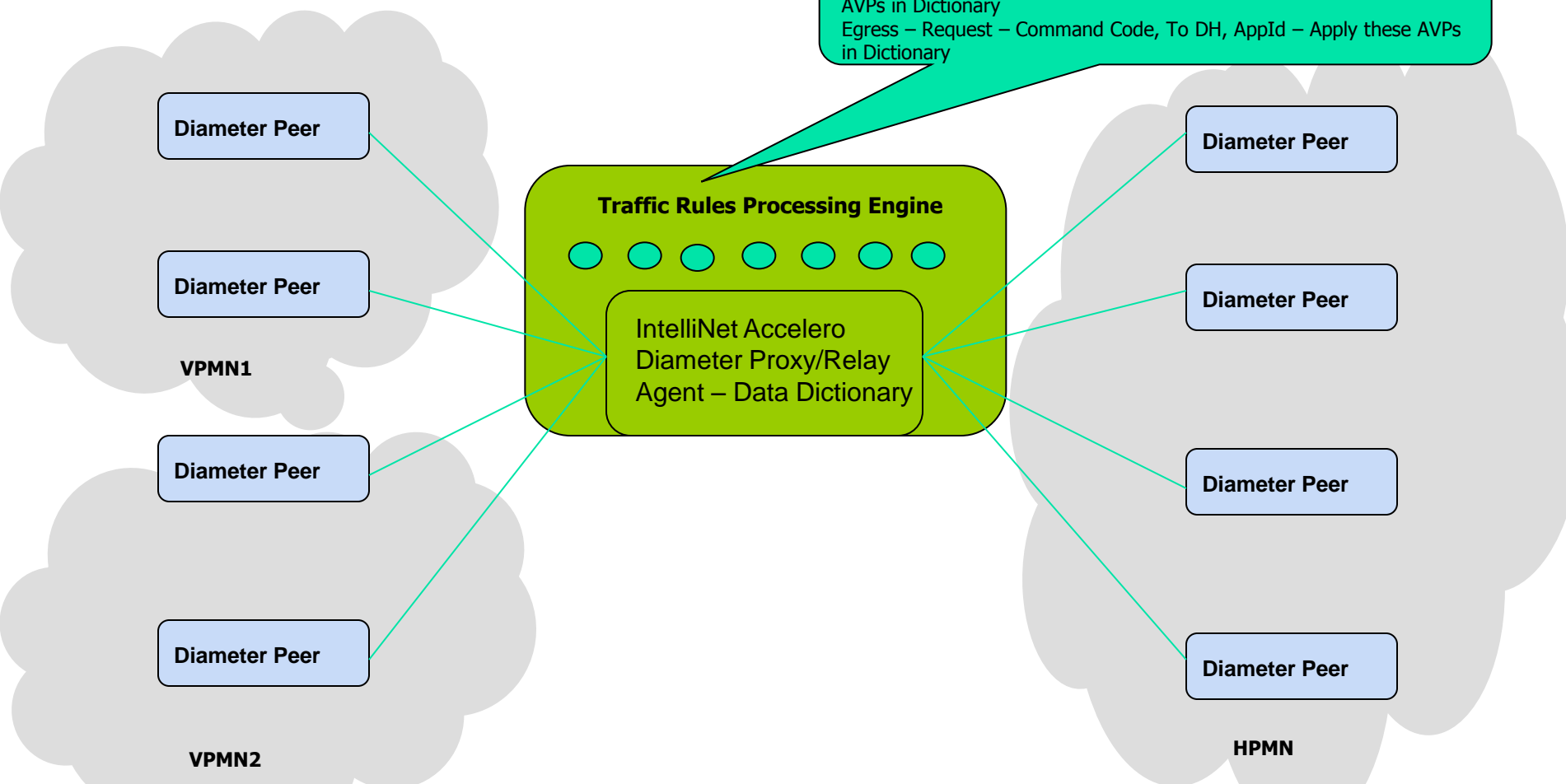


Accelero Diameter Agent – Modular Architecture



Routing Control Flexibility

Define and Apply Traffic Selector Rules –
Ingress – Request – Command Code, From OH, AppId – Apply these AVPs in Dictionary
Egress – Request – Command Code, To DH, AppId – Apply these AVPs in Dictionary



Apply traffic selector rules

Accelero Diameter

Key Features

| | |
|--------------------------------|---|
| Appl Support | Widest support for Next Generation Applications IMS/MMD/TISpan Cx,Sh,Rf,Ro,Gx,Rx,Gq,Gq',Tx,Ty,Wx,Wm,Wd, E2, E4, S6a, S13, S9 |
| Extensibility | Type safe API in C++ User-friendly classes for messages and AVPs. Thread-safe Compiler generation of APIs from ABNF specifications using formal methods. Extensible using a XML Data Dictionary |
| Performance | Up to 120K messages/sec @ 40% CPU on ATCA CCPU XE80 blade Up to 20K Messages/sec @ 40% CPU usage on entry level Dual Intel® Xeon™ 3.0 GHz CPU |
| HA & OAM | Active/Cold, Hot Standby and Active/Active Redundancy Multiple Trace & Log levels; Alarms; Dynamic Configuration, XML Persistency |
| OS Support | Linux ES/FC 4.x (kernel 2.6) and Solaris-10 |
| Transports | Support for TCP/UDP and SCTP transports. Security provisions for IPSEC and TLS, IPv4 and IPv6 Support |
| Peer Discovery | Support for Dynamic Peer Discovery as per RFC 3588 and GSMA IR.88 |
| Standards & Interop | RFC 3588, DCCA RFC 4006, Dynamic Peer Discovery Commitment to IETF. Participated in 1 st interop tests. Hosted the 2nd interop for the DIME WG |

Key Features (continued)

- ▶ Capability to load balance traffic based on Diameter AVP inspection
 - ▶ Origin-Host, Origin-Realm, AppId, Destination-Host, Destination-Realm
 - ▶ PLMN-Id, MSISDN etc
 - ▶ Round-robin, broadcast
- ▶ Network Management
 - ▶ Complete Operator control for Access and Policy Rule Definition
 - ▶ Full fledged configuration and MML support for the operator to configure the system
 - ▶ MML Commands to manage Realms, Peers, Timers and Complete Diameter Agent Configuration
 - ▶ SNMP Alarms and MIB
 - ▶ Ability to configure message content modifications as per Operator's needs

Key Features (continued)

- ▶ The Proxy agent discovers the next hop proxy agent/server using Dynamic Peer Discovery
 - ▶ The proxy agent consults a list of statically configured Diameter agents on a per realm basis
 - ▶ The proxy agent performs a NAPTR query for a server in a particular realm
 - These result in the address of the server (IP address and port)
 - These result in the appropriate transport to use for establishing a communication (TCP/SCTP)
 - ▶ The proxy agent then establishes communication with the appropriate server
 - ▶ The proxy agent exchanges capabilities (CER/CEA) with the appropriate server
 - ▶ The proxy agent then forwards the message to the server/agent
- ▶ Support for IPv6
 - ▶ Support IPv6 at the transport level
 - ▶ Can communicate with different peers using IPv4 or IPv6 as appropriate

Key Features (continued)

- ▶ S6a Interface – MME-HSS – Role of Proxy Agents – 29.272 – Supported
- ▶ User Identity to HSS Resolution
 - ▶ Mechanism allows the Diameter Proxy in the Home network to identify the correct HSS that holds subscriber data for a given User Identity
- ▶ In non-roaming scenario
 - ▶ Needed where more than one HSS exist in the Home Network.
 - Each MME/SGSN shall be configured with the identity of the Proxy Agent
- ▶ In roaming scenario
 - ▶ Diameter Agents in the Home network receiving signalling from visited networks shall be configured with the identity of the Proxy agent
- ▶ The Proxy Agent has the logic to convert the User Identity to an appropriate HSS
- ▶ The Proxy Agent maintains session state and transaction state and add appropriate AVPs (for ex: Route-Record, Proxy-Info) as specified in RFC 3588
- ▶ The Proxy Agent communicates the conversion in the Origin Host and Origin Realm AVPs of the Answer message
- ▶ In Roaming scenario the Diameter Proxy stores this determined HSS address in it's local tables and use it for routing decisions

FT-HA

- ▶ 1+1 Redundancy mechanism provided
- ▶ Active-Cold Standby Support
- ▶ Synchronizes state information to enable recovery during a failure.
- ▶ Replication subsystem with Distributed Shared Memory – Efficient In-memory context sharing scheme across different nodes
- ▶ Supports Local as well as Geographical Redundancy using IP Failover techniques

