IETF 88

NTP ARCHITECTURE and IMPLEMENTATION

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WHY TIME SYNCH?

- Increasingly important for various network management functions
- Performance
- Diagnostics
- Security
- Metrics
- Reporting

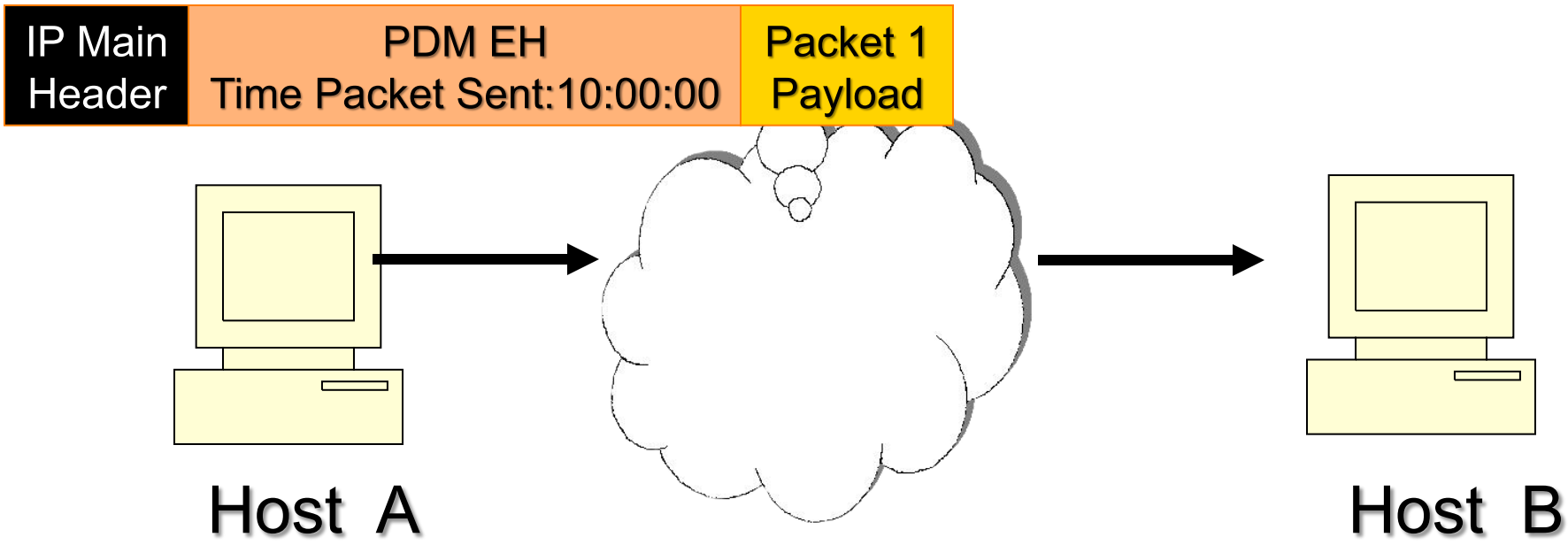
- PDM

We propose:

Requirement	Solution (IPv6)
In basic IPv6 transport	•**Implementation** of existing extension header: Destination Options Header (DOH)
Unmolested by middle systems	•Performance and Diagnostic Metrics (PDM) DOH
	•PDM 1: Requires time synchronization
	•PDM 2: No time synchronization
	•IPR declared

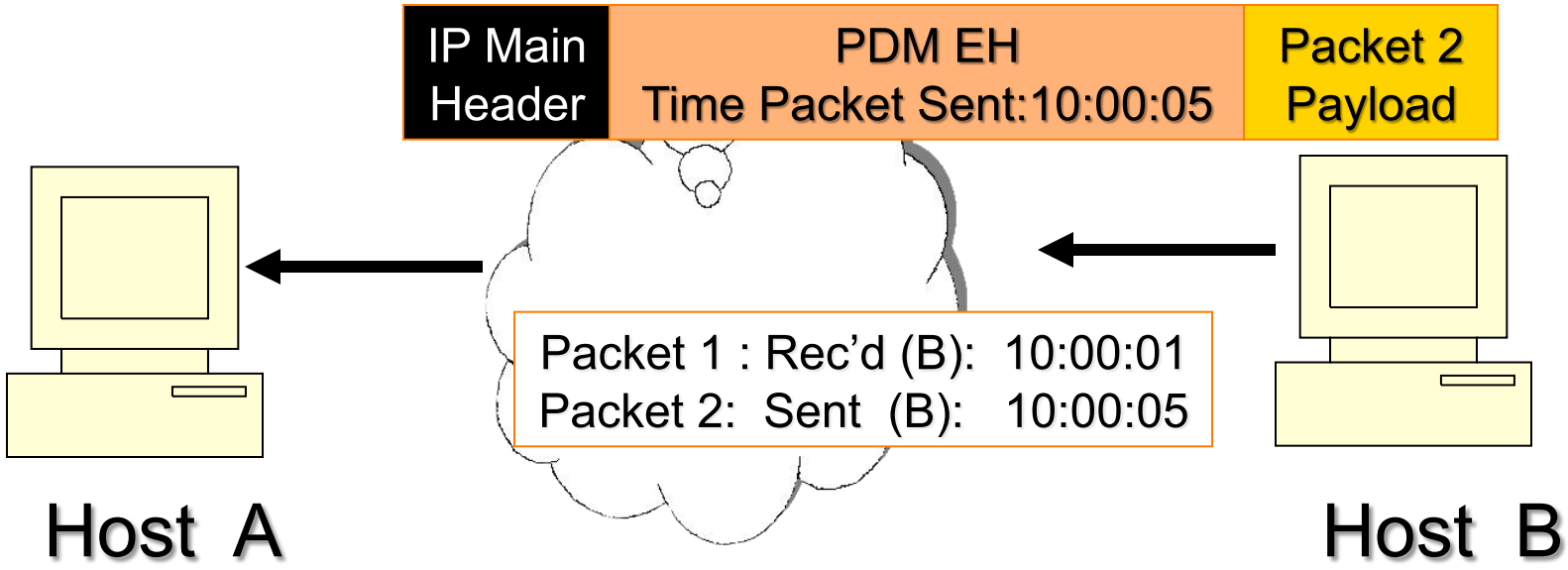
Response Time Measurement Step 1

- Packet 1 sent from source host A
- Time-stamped leaving Host A
- Timestamp is in PDM extension header



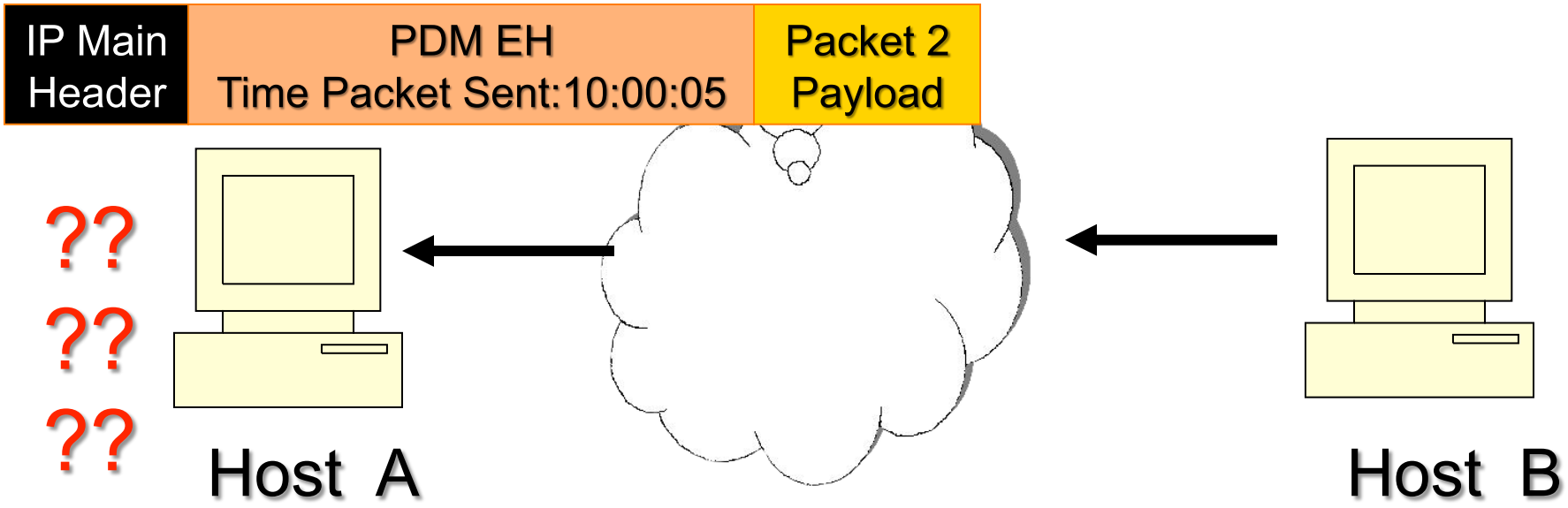
Response Time Measurement Step 2

- Packet 2 sent from Host B (response to Packet 1)
- Time-stamped leaving Host B
- Processing Time = Packet 2 sent (B) - Packet 1 rec'd (B)



When Did it Get to Host A?

- When did Packet 2 to arrive at Host A?
- Return route may not be the same, may be congestion, packet might never arrive.



WHAT BCBS DID

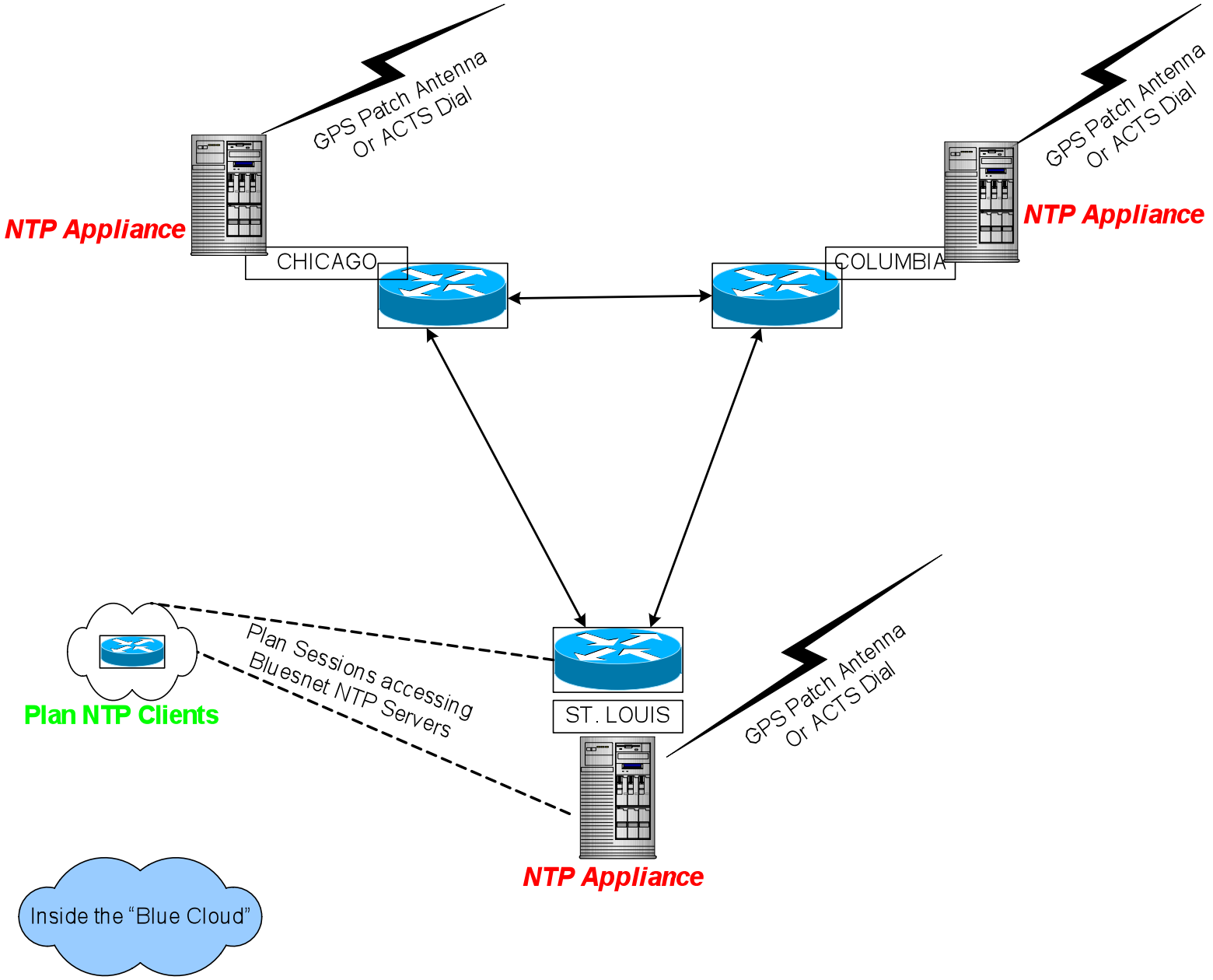
- GOAL: Synchronize time across devices attached to BCBS Nationwide Network
- Developed NTP Recommendation.
- Determine precise timing requirements
- Recommend architecture

- Produce installation parameters, examples, documentation.
- Perform Pilot testing.
- Utilize all above to create “Cookbook”

PROPOSED ARCHITECTURE

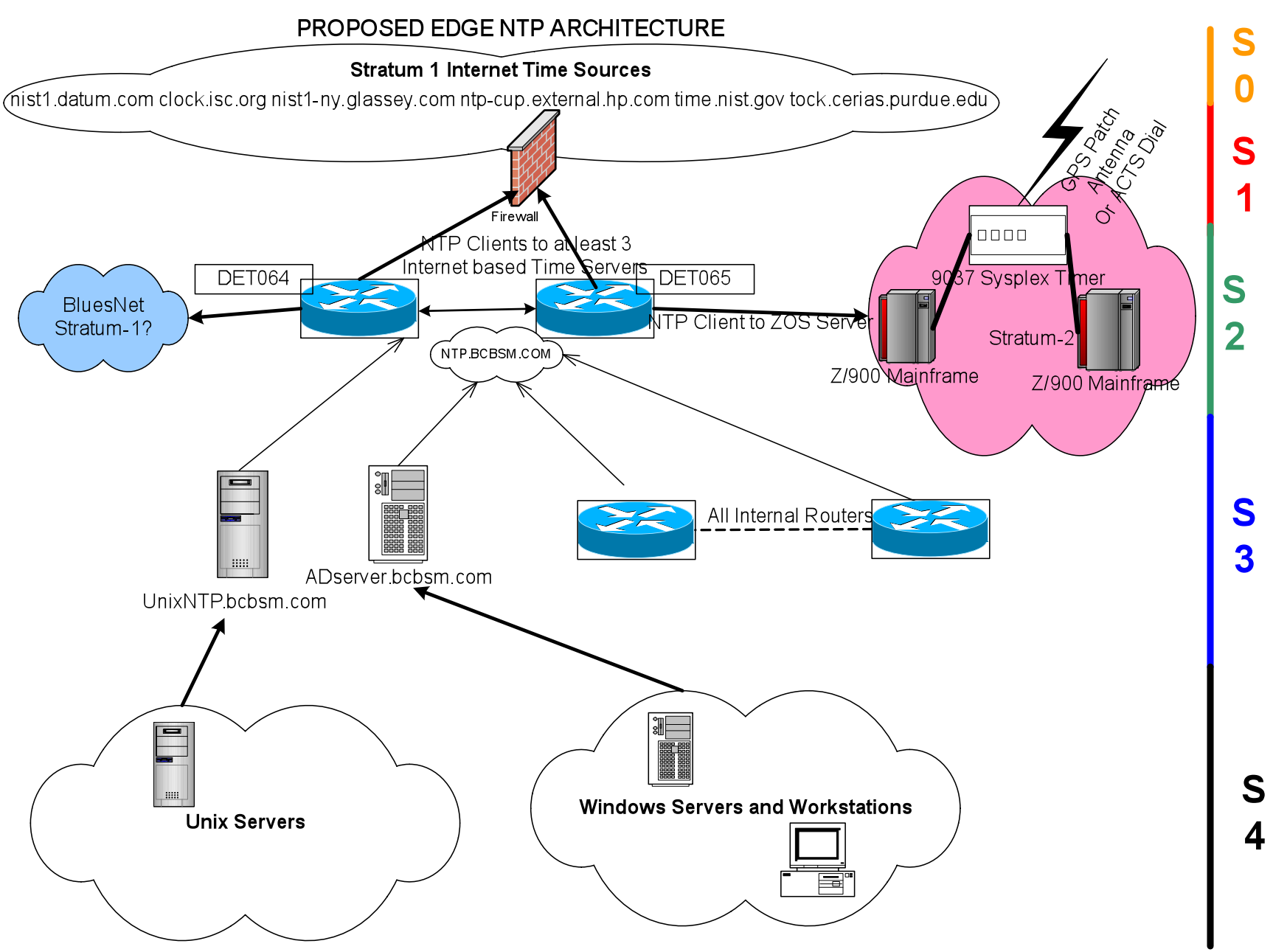
- Intended to achieve all specifications of NTP Recommendation.
- Single ended Arrows represent client/Server Connections
- Double ended Arrows represent Symmetric Peers.
- DNS should be used at all levels.
  - Round Robin to achieve load balancing and redundancy.
- Redundancy should be required at all levels
  - Except perhaps workstations.

- IBM Mainframes.
  - NTP implementation is Server only.



PROPOSED BACKBONE NTP ARCHITECTURE

November 5, 2013



November 5, 2013

QUESTIONS.....

- ????

- Thanks for your attention!