CM Timers John J. Downey – Cisco Systems CMTS Technical Leader 1/19/12

T1 Timeouts—The number of times that the CM timed out waiting for a UCD message from the CMTS.

T2 Timeouts—The number of times that the CM timed out waiting for a broadcast ranging response from the CMTS.

T3 Timeouts—The number of times that the CM timed out waiting for a ranging response from the CMTS.

T4 Timeouts—The number of times the CM has reinitialized its MAC layer because it did not receive a Periodic Ranging opportunity from the CMTS.

Note: Cisco sends a keepalive (station maintenance) every 20 seconds. If N+1 for linecard redundancy is configured, we send every 15 seconds.

If there is an US issue (timing, noise, disconnect, etc.), then the 200 msec timer will kick off. The CMTS will go into a fast mode to send a keepalive every 1 sec. for at least 16 attempts then it will quit sending DS sync, then the modem will eventually get a T4 timeout.

The modem's T4 timer is reset every time a keepalive comes down to it.

So, if there's an US problem, the CM could get multiple T3s every second for 16 attempts. The CM will finally start rescanning DS after the 16 + 30 second T4.

T4 is typically DS related.

T3 time outs are indicative of Common Path Distortion, Ingress, Micro Reflections, Group Delay, In-frequency Response, or even disconnecting the US cable during a maintenance window. So basically anything that causes the CM to lose station maintenance with the CMTS.

Getting 3-5 T3s every 20 seconds is probably ok. This will show up as 3-5 misses for every hit in the flaplist. (sh cable flap-list)

Supporting Information:

http://www.cisco.com/univercd/cc/td/doc/product/cable/cab_modm/ubcmerrs.htm %UBR900-3-RESET_T3_RETRIES_EXHAUSTED: R03.0 Ranging Request Retries exhausted

Explanation: The CM has sent 16 Ranging Request (RNG-REQ) messages without receiving a Ranging Response (RNG-RSP) message in reply from the CMTS. The CM is therefore resetting its cable interface and restarting the registration process. This typically is caused by noise on the

US that causes the loss of MAC-layer messages. Noise could also decrease the signal-to-noise ratio (SNR) on the US to a point where the CM's power level is insufficient to transmit any messages. If the CM cannot raise its US transmit power level to a level that allows successful communication within the maximum timeout period, it resets its cable interface and restarts the registration process. This error message is DOCSIS event message is R03.0, Ranging Request.

Recommended Action: No action is needed if this is an occasional problem. Check the US transmit power for the CM to see if it is at or near the maximum allowable levels. Check the RF plant for cabling or connector issues that could generate sufficient noise to lose MAC-layer management messages. If using a Cisco CMTS, you can use the show cable flap-list command to determine if other CMs on the US are having problems. You can also use the show interfaces cable upstream command and examine the noise, micro-reflection, and uncorrectable error counters to determine the level of noise on the US.

%UBR900-3-RESET_T4_EXPIRED: R04.0 Received Response to Broadcast Maintenance Request, But no Unicast Maintenance opportunities received. T4 timeout.

Explanation: The CM did not received a station maintenance opportunity in which to transmit a Ranging Request (RNG-REQ) message within the T4 timeout period (30 to 35 seconds). The CM is resetting its cable interface and restarting the registration process. Typically, this indicates an occasional, temporary loss of service, but if the problem persists, check for possible service outages or maintenance activity on this particular headend system. This error message is DOCSIS event message is R04.0, Ranging Request.

Recommended Action: Check the configuration on the CMTS. Check the cable plant for RF connector or cabling issues that could be generating noise on the DS and US. If using a Cisco CMTS, you can use the show cable flap-list command to determine if other CMs on the US are having problems. You can also use show interfaces commands to examine, micro-reflection and uncorrectable error counters to determine the level of noise on the US.