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RE: S5-166262, LS reply to ATIS on "Establish a Metric to Determine a Drop in Registered Users in an IP-Based Network"

Dear Messrs. Tovinger, Cornily, and Toche:

The Alliance for Telecommunications Industry Solutions (ATIS) Network Reliability Steering Committee (NRSC) appreciates your reply LS (registered as S5-166262) regarding NRSC's request to establish a metric to determine a drop in registered users an IP-based network.

The NRSC has reviewed your questions and is providing a response in order to progress this work item. Below please find NRSC input clarifying the two metrics indicated by the 3GPP SA5 and responding to your questions.

Metrics:
Metric #1: A standard that shall monitor a drop in registered users at the P-CSCF or I-CSCF minus successful deregistration multiplied by 100 to yield the percentage of registered users dropped at the network's ingress. This metric would monitor the network's ingress for last mile outages and those only affecting localized areas.

- **NRSC Comment on Metric #1: The location of registered users who have been dropped is important to determine the area of impact (market, city, county, state). Based on this, NRSC recommends removing I-CSCF from the above metric.**

Metric #2: A standard that shall monitor a drop in registered users at the network's core (I-CSCF) minus successful deregistration multiplied by 100 to yield the percentage of registered

users dropped on the network. This metric would monitor for more systemic issues across the network.

- **NRSC Comment on Metric #2: The I-CSCF was discussed as being the core network interface to monitor of the percentage of registered users dropped from the network**

Questions and Answers:

Question N1: is our understanding correct that the numerator of the formula above is made up of 3 parts which are: # of IRAs, Total # of REGISTER Requests Polled registered users every 15 minutes,Deregistration (Expires:0) 200 OK.

- **NRSC Answer N1: This assumption is correct.**

Question N2: Is "# of IRAs" relevant, given Statement No. 1 above?

- **NRSC Answer N2: The number of IRAs is important because this tells us the number of registrations that failed. We would also consider other valid data points such as TS 32.409 [4] Section 4.1.1.2.2 the number of successful re-registrations**

Question N3: Also, acc. to RFC 6076, IRA is measured based only on initial REGISTER requests, i.e. not on re-registration requests. UEs staying connected do emit re-registration requests periodically. Are these requests out of scope of ATIS NRSC?

- **NRSC Answer N3**: **The NRSC believes that the Ineffective Registration Attempts for re-registration attempts should also be considered when determining the total number of Ineffective Registration Attempts.**

Question N4: "Total # of REGISTER Requests Polled registered users every 15 minutes" seems to mix up two possible measurements: a/ Nb. of REGISTER attempted / failed / successful requests (for example on receipt by the P-CSCF or S-CSCF of a SIP_REGISTER message – cf. TS 32.409 [4] Section 4.1.1.1) and b/ Nb. of SIP registered users e.g. in P-CSCF. Please clarify. In addition, shall the 15 minutes polling period be fixed or shall it be configurable by Operator when initiating the measurement job?

- **NRSC Answer N4: Using the REGISTER attempts minus IRA (failed attempts) for both initial and re-registration requests will provide the derived number of successful registrations. Having the polling period being configurable is acceptable to the NRSC, and recommends that the period be under 30 minutes.**

Question N5: "Deregistration (Expires:0) 200 OK": does this term capture the number of deregistrations initiated by the UE? Or any x-CSCF? Please clarify.

- **NRSC Answer N5: Yes, the 200 OK is derived from the UE. This is a metric currently tallied by service assurance tool suites**.

Question N6: in "normal" networking conditions, it is expected that nb. of IRAs be close to zero (converge towards zero), leading to that the numerator of the formula above becoming negative (0 minus …). It would be strange to define a metric becoming negative in optimal networking conditions. Can you please clarify?

- **NRSC Answer N6: In the numerator, we are measuring the registration <u>attempts</u> minus the IRA (failed Registrations) to determine the number of successful registration; this should not result in a negative number**.

Question D1: Why is the denominator based on HSS related measurements, whereas this metric should also be applicable to any P-/I-CSCF?

- **NRSC Answer D1: The HSS concept was derived to account for all known active/subscribed UE. We would consider any valid data point that would provide an accurate accounting of active/subscribed UE**.

<u>Other question:</u> in their LS, ATIS mentions: "A majority of network impairments come from the last mile connectivity and it would be useful to monitor for a drop in registered users at the access point using the Proxy-Call Session Control Function (P-CSCF) or Interrogating-CSCF (I-CSCF). As well, in order to identify localized events, a core metric is needed to capture widespread or network related outages".

<u>Question O1:</u> Please clarify if ATIS considers P-CSCF and/or I-CSCF as "last mile" network elements.

- **NRSC Answer O1: As corrected above in Metric 1 & 2, ATIS views the P-CSCF as the ingress point from last-mile assets.**

<u>Question O2:</u> In order to identify localized events, a "core metric" would probably give few information on the location of the events. Where such a "core metric" should be measured, i.e. from which type of network element(s)?

- **NRSC Answer O2: As corrected above in Metric 1 & 2, ATIS denotes the I-CSCF element for the Core Metric.**

Sincerely,

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