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RE: S5-171812, LS reply to ATIS NRSC 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 S5-171812) regarding NRSC's request to establish a metric to determine a drop in registered users in an IP-based network.

The NRSC would like to thank 3GPP SA5 for the work performed during the SA5#112 meeting. The NRSC is encouraged by the development of potential solutions for monitoring a drop in registered users. To this end, we have provided responses to your questions below:

Statement 1: ATIS NRSC is expecting a standardized metric to monitor the number of registered users at P-CSCF level; S-CSCF is not in scope any longer. However, determining the location of impacted users in case of a drop in registered users at P-CSCF level is up to the operator, especially in case of fixed users.

NRSC Reply to 3GPP SA5 Statement 1:

- The NRSC is in agreement with monitoring the number of registered users at the P-CSCF level.
- NRSC still sees benefit in monitoring the number of registered users at the S-CSCF level. Monitoring the S-CSCF for the number of registered users helps carriers detect possible changes in network conditions at the enterprise level.
- The NRSC understands that network architecture plays a role in determining the location of impacted users and feels this should be fully explained in the proposed metric.

Statement 2: Periodically measuring such a metric will enable to detect drops in registered users at P-CSCF.

NRSC Reply to 3GPP SA5 Statement 2:

- The NRSC has concerns with measuring the number of registered users during set time intervals and comparing them over time. This approach may provide an unrealistic view of network availability of an end user.
- Using a denominator of actual users from a database such as a HSS or HLR would provide a better representation in the number of dropped registered users at the P-CSCF and S-CSCF levels.
- Excluding successful de-registrations in both the numerator and the denominator would more accurately capture a network event that causes a drop in the number of registrations.

Statement 3: As specified in IETF RFC 6076, IRA (Ineffective Registration Attempts) is to be measured at the initiating UA (User Agent), i.e. at fixed terminal (e.g. residential gateway) or at mobile terminal level. In both cases, this is not in scope of 3GPP SA5. Should IRA be needed to meet ATIS NRSC expectations, it shall be measured by other means than 3GPP-defined metrics.

NRSC Reply to 3GPP SA5 Statement 3:

- After further review by the NRSC, the proposed option B would be an acceptable solution for monitoring a drop in registered users.

Statement 4: SA5 believes that the metric proposed by ATIS NRSC is not correct since, as already said, in normal network conditions, the number of IRAs shall converge towards zero. Consequently, subtracting a) Total number of REGISTER Requests and b) Number of Deregistration Requests, from the Number of IRAs, would lead to a negative value of the numerator of the proposed metric. 3GPP SA5 believes something is wrong in the proposed metric.

NRSC Reply to 3GPP SA5 Statement 4:

- The NRSC is in agreement with this observation. The corrected numerator would be: ((Total # of Register Requests Polled registered users every 15 minutes) – [Deregistration (Expires: 0) 200 OK]) - # of IRAs
- The corrected formula would then be:

$$\text{Drop in Registered Users \%} = \frac{((\text{Total \# of Register Requests Polled registered users every 15 minutes}) - [\text{Deregistration (Expires: 0) 200 OK}] - \text{\# of IRAs})}{(\text{\# of Registered Users from HSS/HLR}) - [\text{Deregistration (Expires: 0) 200 OK}]} \times 100$$

Statement 5: Our feeling with regard to the metric proposed by ATIS NRSC is enforced by the following answer provided by ATIS NRSC to 3GPP SA5 question N6: “NRSC Answer N6: In the numerator, we are measuring the registration attempts minus the IRA (failed Registrations) to determine the number of successful registration; this should not result in a negative number”. This answer makes 3GPP SA5 think that the numerator of the proposed metric should be: (Total number of REGISTER Requests - Number of IRAs) instead of (Number of IRAs - Total number of REGISTER Requests).

NRSC Reply to 3GPP SA5 Statement 5:

- NRSC is in agreement with the change to the metric, as noted in the response to #4.

Statement 5, Option A: Solution based on monitoring the number of successful re-Registrations at P-CSCF level

NRSC Reply to Option A:

- The NRSC favors Option B over Option A. Option A does not take into effect the inability for a UE to request a registration attempt. This condition can occur in a live network due to network impairments preventing communications with the UE. This condition is one the NRSC is most interested in capturing with a drop in registered users metric.

Statement 5, Option B: Solution based on monitoring the number of registered users at P-CSCF

NRSC Reply to Option B:

- As previously mentioned, the NRSC sees value in expanding TS.32.409 to include the number of registered users in a P-CSCF.
- Additionally, the NRSC would like to propose some enhancements to Option B, specifically addressing the number of registered users. These enhancements would be beneficial in defining a reality-based metric the industry can use to detect a drop in registered users in both the P-CSCF and S-CSCF levels.
 - The NRSC would propose a similar change be made for a number of registered users in a S-CSCF.
 - Excluding successful de-registrations in both the numerator and the denominator would more accurately capture a network event that causes a drop in the number of registrations.
- As mentioned above, using a denominator based on actual users from a database such as a HSS or HLR would provide a better representation in the number of dropped registered users at the P-CSCF and S-CSCF levels.

If you have any questions or comments please feel free to contact either of us.

Sincerely,

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