

Time analysis – Reservation time in S&C

The total time is calculated using the worst case results, i.e., if the reservation process is parallel, total time is calculated as a sum of the verification time and reservation time of the slowest node in the segment R_{isc}

$$R_{isc} = t_v + R_{ts}, \quad (2)$$

where t_v – is the verification time; R_{ts} – is the necessary time for reservation of the slowest node in the segment.

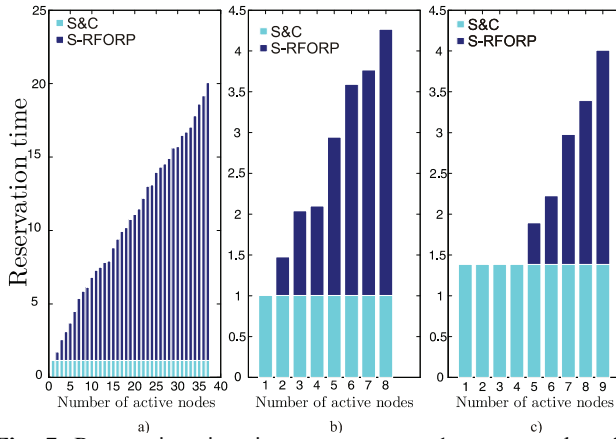


Fig. 7. Reservation time in segments: a – 1. segment; b – 2. segment; c – 3. segment

Blocking probability

As shown before, the main task of reservation protocol is to reduce the time which is important in discovery and reservation phases. Another very important parameter is blocking probability. As can be seen in Fig. 8, blocking probability in S-RFORP protocol is dependent on the number of active nodes, but the new S&C protocol is not.

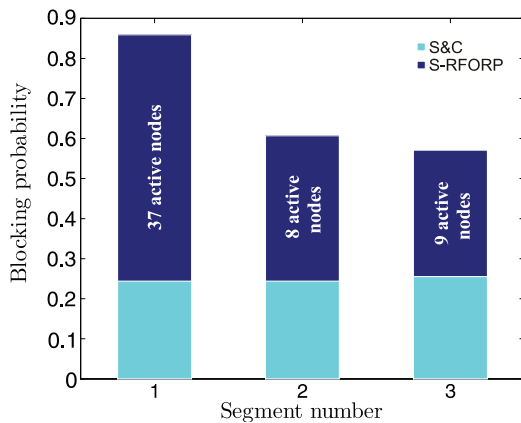


Fig. 8. Blocking probability for each segment

Fig. 9, Fig. 10 and Fig. 11 map dependence of blocking probability on intensity (in our case, intensity is dependent on traffic load and number of active nodes).

When intensity increased, blocking probability of both protocols had exponentially increasing character, but S&C did not increase as fast as S-RFORP. As a result, the

S&C protocol has better potential for utilisation of node resources as S-RFORP.

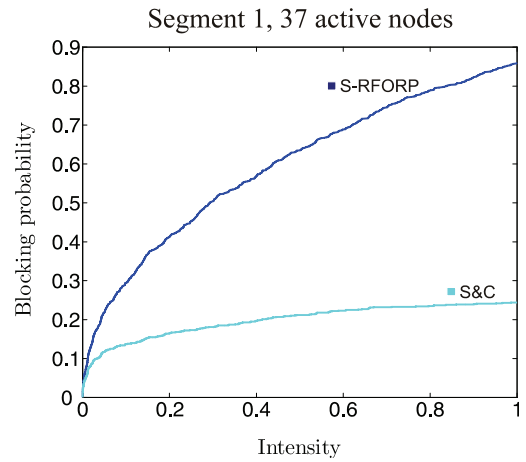


Fig. 9. Blocking probability versus intensity in 1. segment

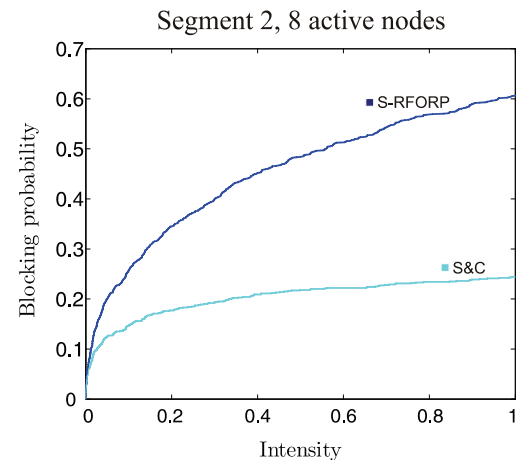


Fig. 10. Blocking probability versus intensity in 2. segment

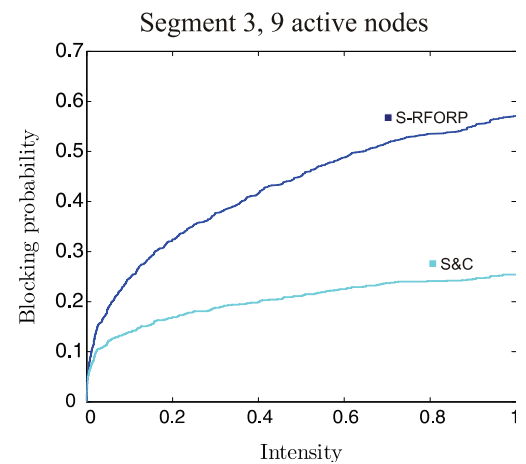


Fig. 11. Blocking probability versus intensity in 3. segment

Conclusions

The main target of proposing this new reservation protocol was to reduce discovery and intra-segment reservation times. It was shown in this paper (see figs. 5, 7 and 10) that S&C does not depend on the number of active nodes in a segment. It depends on the master node speed

only (see on Fig. 10, 8). If this node is faster than all the other nodes in the segment and there are many nodes in the segment, S&C reservation protocol is more powerful than S-RFORP. S&C also uses node resources better that manifests itself in lower blocking probability.

Acknowledgements

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M. Markovic, J. Dubovan, M. Dado. Search & Compare (S&C) - Reservation Protocol in High-Speed Optical Networks // Electronics and Electrical Engineering. – Kaunas: Technologija, 2011. – No. 8(114). – P. 39–42.

In this paper we deal with a new reservation protocol for high-speed optical networks called Search & Compare. This reservation protocol is improved Segment-based Robust Fast Optical Reservation Protocol (S-RFORP). S&C protocol contain is composed of two parts: inter-segment and intra-segment. The first part of this paper deals with the design of reservation protocol and the second part with the detailed analysis. Ill. 11, bibl. 8, tabl. 1 (in English; abstracts in English and Lithuanian).

M. Markovic, J. Dubovan, M. Dado. Rezervacijos protokolo taikymas didelės spartos optiniuose duomenų perdavimo tinkluose // Elektronika ir elektrotechnika. – Kaunas: Technologija, 2011. – Nr. 8(114). – P. 39–42.

Analizuojamas naujas rezervacijos protokolas, taikomas didelės spartos optiniuose duomenų perdavimo tinkluose, vadinamas „surask ir lygink“. Analizuojamas rezervavimo protokolas patobulino S-RFORP protokolą, susidedantį iš tarpsegmentinių ir vidinių segmentinių dalių. Pirmojoje straipsnio dalyje pateikiamas rezervacijos protokolo projektavimas, antrojoje – detali analizė. Il. 11, bibl. 8, lent. 1 (anglų kalba; santraukos anglų ir lietuvių k.).