Non-work Conserving Stateless Core Fair Queuing (N-SCORE)

draft-ryoo-detnet-nscore-01

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Update of N-SCORE

- Identify the appropriate suitable category for N-SCORE among those defined in the Taxonomy draft.
- The contents of Chapter 7 have been updated to reflect the revised Taxonomy draft.

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   N-SCORE is a non-periodic, asynchronous, flow level, non-work
   conserving, on-time, rate-based solution.

   The draft of the taxonomy also defines seven suitable categories for
   deterministic networking as follows.

   *  Right-bounded category

   *  Flow level periodic bounded category

   *  Class level periodic bounded category

   *  Flow level non-periodic bounded category

   *  Class level non-periodic bounded category

   *  Flow level rate based unbounded category
   *  Flow level rate based left-bounded category

   N-SCORE belongs to the "Flow level rate based left-bounded category",
   which is an on-time solution with rate-based service order
   characteristic that can handle a large number of dynamic flows with
   simple admission control.  Additionally, it has flow-level traffic
   granularity characteristics that can minimize the effects of other
   flows' bursts.
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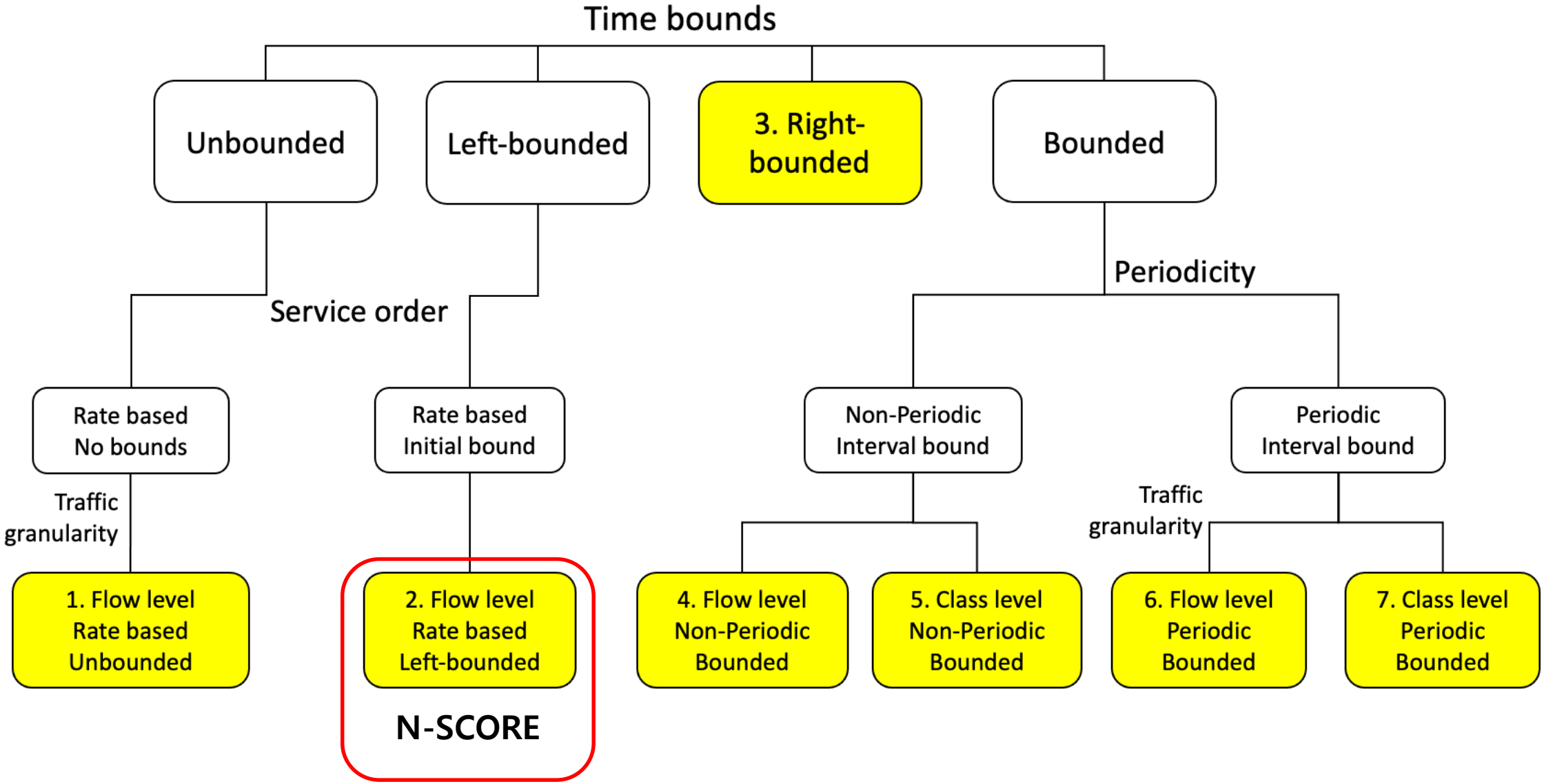
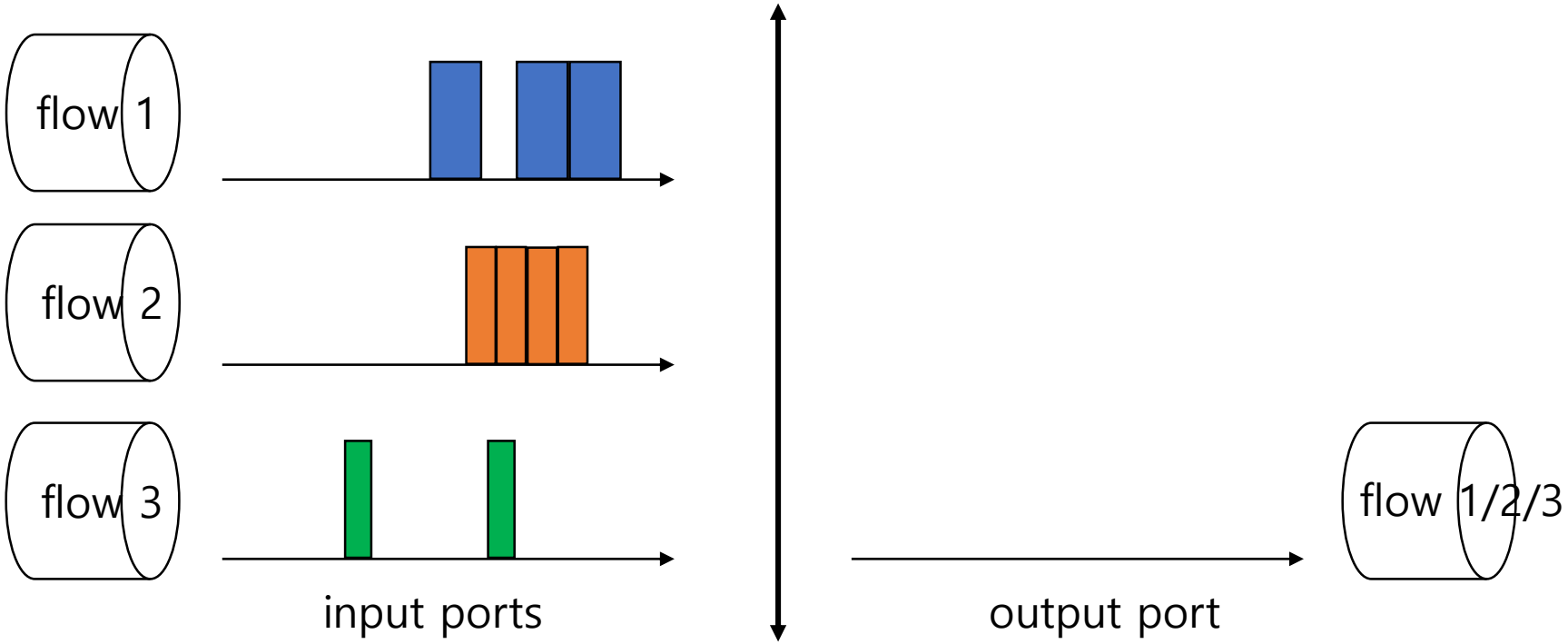
Category of N-SCORE



N-SCORE is the only solution currently being suggested in the 2st suitable category.

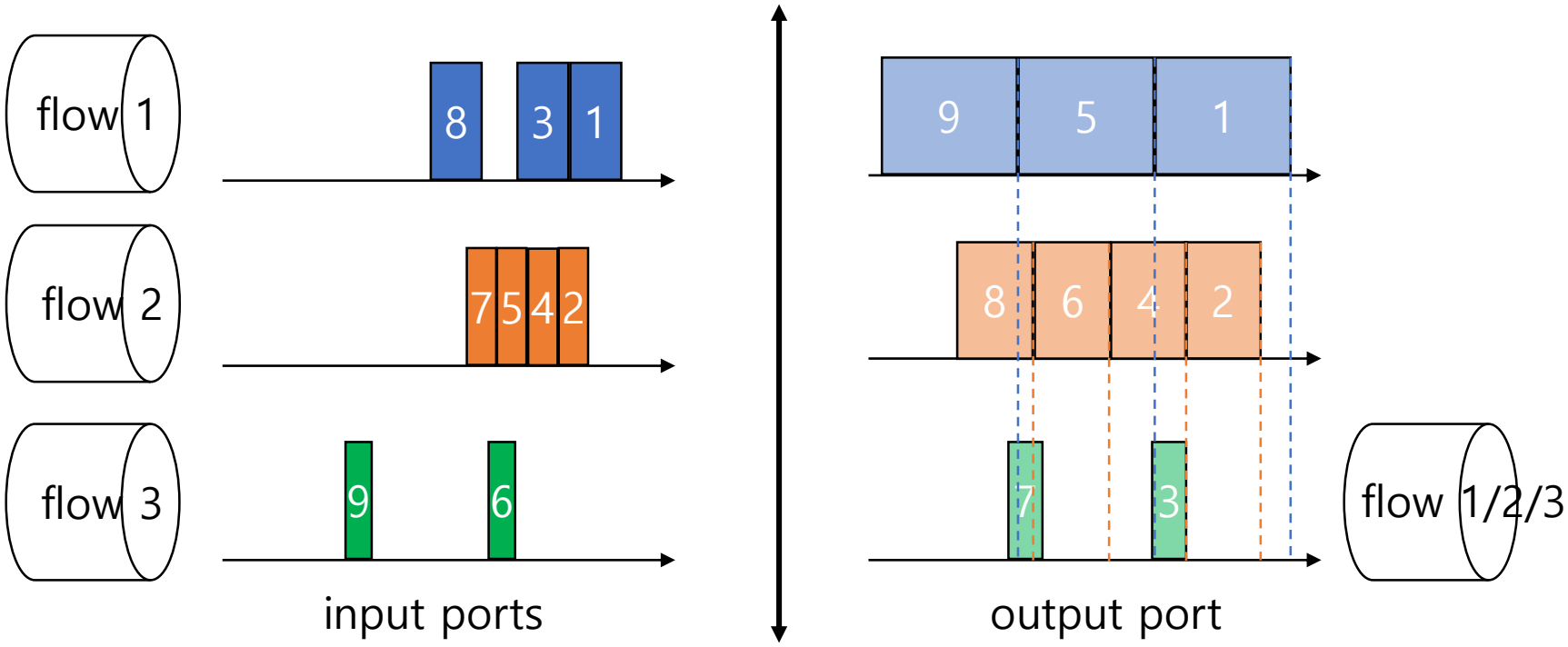
Operation of N-SCORE

- Different flows arrive from input ports.
- Some of them are bursty.
- How these flows from different ports will mix?



Operation of N-SCORE: Determination of the service period(SP)

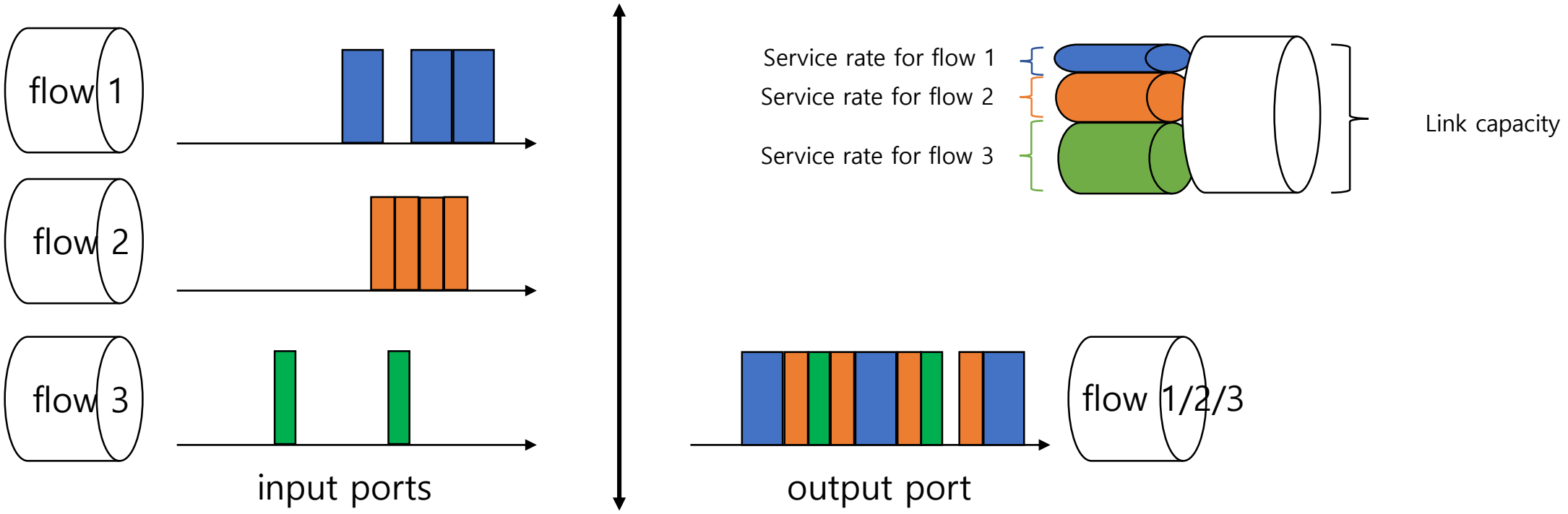
- The service period (i.e., eligible time - ET and finish time - FT) is determined based on the rate assigned to each flow.
- Packets are transmitted after their eligible time, in ascending order of their finish times.



Service period = (E(p) , F(p)]
- E1(p) = max{F1(p-1), A1(p)}
- F1(p) = E1(p) + L(p)/r(p)

Operation of N-SCORE: SP as the service order

- The only necessary condition is that the sum of service rates are less than the link capacity.
- The service completion time of packets are guaranteed to be less than their FTs.



Future Plan

- We plan to implement C-SCORE/N-SCORE on a real system and assess its performance.

  (It includes a C-SCORE/N-SCORE data plane function based on FPGA and a controller plane function that automatically calculates rates that meet user requirements and performs admission control based on an SDN controller.)

Thank you