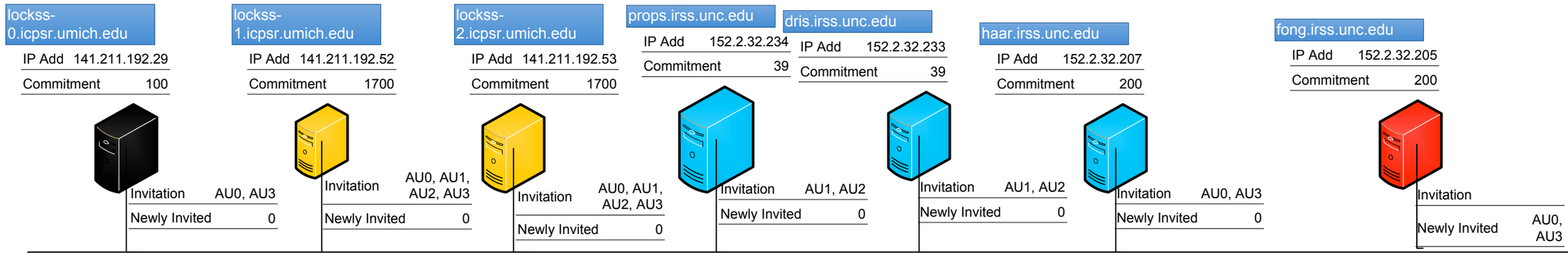
A brief note about UC7:

"Use case 7, host failure: host h_i fails and is replaced with a new host of equal or greater capacity but no content. Reallocate based on schema and host assignments as in 4."

It appears that this use case is similar to use case 4, where one host is deleted and one host is added. All LOCKSS machines added in UC4 have no prior content, which seems to satisfy UC7.

However, like I have noted in UC4, there seems to be no dictate that a failed or removed machine's AU's are reproduced on the machine that "replaces" it. See for example UC4 Situation 2 (2 hosts added, 1 removed. The 4 AU's on the removed host are split between a machine that was previously part of the LOCKSS system and one of the added machines).

Data-PASS SSP Use Case 7 (clone of UC4 Situation 2)



SCHEMA UC4

Let there be **h**=6 hosts, where:
H ≡ {lockss-0, lockss-1, lockss-2, props, dris, haar}

Let there be **n**=4 AU's, where AU ≡ {AU0, AU1, AU2, AU3}

Let there be 2 groups to be defined:
*The set of hosts to be removed, D
*The set of hosts to be added, A

Such that:
1. ||D|| ≤ ||A||
2. For every D_i, i = 0→||D|| - 1, there must be at least as many if not more hosts in the set H - D + A [(H ∩ D') U A) with equal or greater committed space, as there were in H.

Then:
Generate invitations for all hosts such that:
(Z) The pre-assigned AU's in hosts H - D [H ∩ D'] are not disturbed.
(A) For each AU, there are at least **k**=4 hosts harvesting.
(B) For each host, the sum of max size of AU's harvested is less than the storage commitment.

Situation 2: Add 1 host, remove 1 host
*A = {fong}
*D = {lockss-0}

Conditions
- ||D|| ≤ ||A|| (1 ≤ 1)
- For every D_i, i = 0 → ||D|| - 1, there must be at least as many if not more hosts in the set H - D + A [(H ∩ D') U A) with equal or greater committed space, as there were in H.
  H = {lockss-1 [1700], lockss-2 [1700], haar [200], lockss-0 [100], props [39], dris [39]}
  H-D+A = {lockss-1 [1700], lockss-2 [1700], haar [200], fong [200], props [39], dris [39]}

For lockss-0 [100]:
*4 machines had committed space equal or greater than 100 in H.
*4 machines have committed space equal to or greater than 100 in H - D + A.

Generate ||H - D + A|| (7) invitations:

*Preserve invitations for hosts in H-D:
+lockss-1: AU0, AU1, AU2, AU3
+lockss-2: AU0, AU1, AU2, AU3
+props: AU1, AU2
+dris: AU1, AU2
+haar: AU0, AU3

*For each AU, **k**=4 hosts are harvesting:
+AU0 [size=95]: lockss-1, lockss-2, haar (**k**=3)--insufficient hosts!
*Cannot invite props (committed 39, harvesting 36)
*Cannot invite dris (comm 39, harv 36)
*Can invite fong (comm 200, harv 0), **k**=4
+AU1 [size=18]: lockss-1, lockss-2, props, dris (**k**=4)
+AU2 [size=18]: lockss-1, lockss-2, props, dris
+AU3 [size=4]: lockss-1, lockss-2, haar (**k**=3)--insufficient hosts!
*Cannot invite props (comm 39, harv 36)
*Cannot invite dris (comm 39, harv 36)
*Can invite fong(comm 200,harv 95), **k**=4

*Generate new invitations:
+fong: AU0, AU3

Machine Ownership Key
ICPSR
Odum Institute
New host
Deleted host