Validation Reconsidered

in pictures
Suppose we had the following

```
  P
  |
  v
  A
  |
  v
  B1
  |
  v
  C1
  |
  v
  D1
  |
  v
  B2
  |
  v
  C2
  |
  v
  D2
  |
  v
  B3
  |
  v
  C3
  |
  v
  D3
```
Suppose P reduces A’s resources

B1’s resources are all in Keep_A

B2’s resources are
- Keep_B (in Keep_A)
- Yank_B (in Yank_A)

B3’s resources are all in Yank_A

C1’s resources are all in Keep_B

C2’s resources are
- Keep_C (in Keep_B)
- Yank_C (in Yank_B)

C3’s resources are all in Yank_B

D1’s resources are all in Keep_C

D2’s resources are
- Keep_D (in Keep_C)
- Yank_D (in Yank_C)

D3’s resources are all in Yank_C
P issues a new cert for A with only Keep

Cert valid; all resources in Keep

Cert invalid

B1’s resources are all in Keep_A

B2’s resources are all in Yank_B (in Keep_A)

B3’s resources are all in Yank_A

Cert A: Keep

The following certs will be affected by the encompassing rule

Cert valid; all resources in Keep

Cert invalid

B1’s resources are all in Keep_A

B2’s resources are all in Yank_B (in Keep_A)

B3’s resources are all in Yank_A

Cert A: Keep
P issues a new cert for A with only
Keep – consider collateral damage

Cert valid; all resources in Keep
Cert invalid; all resources in Yank
Cert invalid; some resources in Keep

B1’s resources are all in Keep_A
B2’s resources are Keep_B (in Keep_A)
B3’s resources are all in Yank_A

Cert A: Keep_A
The following certs will be
affected by the
encompassing rule

Cert valid; all resources in Keep
Cert invalid; all resources in Yank
Cert invalid; some resources in Keep

B1’s resources are all in Keep_A
B2’s resources are Keep_B (in Keep_A)
B3’s resources are all in Yank_A

Cert valid; all resources in Keep
Cert invalid; all resources in Yank
Cert invalid; some resources in Keep

B1’s resources are all in Keep_A
B2’s resources are Keep_B (in Keep_A)
B3’s resources are all in Yank_A
A issues a new cert for B2 with only Keep

Cert valid; all resources in Keep
Cert invalid; all resources in Yank
Cert invalid; some resources in Keep

B1’s resources are all in Keep_A
B2’s resources are Keep_B (in Keep_A)
C1’s resources are all in Keep_B
C2’s resources are Keep_C (in Keep_B)
D1

B3’s resources are all in Yank_A
C3’s resources are all in Yank_B
C2’s resources are Yank_C (in Yank_B)
D2

Cert A: Keep_A

The following certs will be affected by the encompassing rule

Cert valid; all resources in Keep
Cert invalid; all resources in Yank
Cert invalid; some resources in Keep

B1’s resources are all in Keep_A
B2’s resources are Keep_B (in Keep_A)
C1’s resources are all in Keep_B
C2’s resources are Keep_C (in Keep_B)
D1

B3’s resources are all in Yank_A
C3’s resources are all in Yank_B
C2’s resources are Yank_C (in Yank_B)
D2

11/6/15
IETF 94 SIDR
B2 issues a new cert for C2 with only Keep

Cert valid; all resources in Keep
Cert invalid; all resources in Yank
Cert invalid; some resources in Keep

The following certs will be affected by the encompassing rule

Cert A: Keep_A

B1’s resources are all in Keep_A
B2’s resources are Keep_B (in Keep_A)
C1’s resources are all in Keep_B
C2’s resources are Keep_C (in Keep_B)
D1’s resources are all in Keep_C
D2’s resources are Keep_D (in Keep_C)

B3’s resources are all in Yank_A
C3’s resources are all in Yank_B
D3’s resources are all in Yank_C

Yank_A
Yank_B
Yank_C
Yank_D (in Yank_C)

Cert invalid; all resources in Yank
Cert invalid; some resources in Keep

11/6/15
C2 issues a new cert for D2 with only Keep

Cert valid; all resources in Keep
Cert invalid; all resources in Yank
Cert invalid; some resources in Keep

B1’s resources are all in Keep_A
B2’s resources are Keep_B (in Keep_A)
B3’s resources are all in Yank_A

C1’s resources are all in Keep_B
C2’s resources are Keep_C (in Keep_B)
C3’s resources are all in Yank_B

D1’s resources are all in Keep_C
D2’s resources are Keep_D (in Keep_C)
D3’s resources are all in Yank_C

The following certs will be affected by the encompassing rule

Cert A: Keep_A
Cert valid; all resources in Keep

11/6/15
IETF 94 SIDR
Back to the Beginning: Suppose P reduces A’s resources

Partition A’s resources into Keep or Yank

B1’s resources are all in Keep_A

B2’s resources are
- Keep_B (in Keep_A)
- Yank_B (in Yank_A)

B3’s resources are all in Yank_A

C1’s resources are all in Keep_B

C2’s resources are
- Keep_C (in Keep_B)
- Yank_C (in Yank_B)

C3’s resources are all in Yank_B

D1’s resources are all in Keep_C

D2’s resources are
- Keep_D (in Keep_C)
- Yank_D (in Yank_C)

D3’s resources are all in Yank_C
P issues a new cert for A with only
Keep - Validation Reconsidered

Cert valid; all valid resources in Keep
Cert invalid; all resources in Yank
Cert invalid; some resources in Keep

The following certs will be affected by the encompassing rule

Cert A: Keep_A
B1’s resources are all in Keep_A
B2’s resources are Valid: Keep_B (in Keep_A)
Invalid: Yank_B (in Yank_A)
C1’s resources are all in Keep_B
C2’s resources are Valid: Keep_C (in Keep_B)
Invalid: Yank_C (in Yank_B)
D1’s resources are all in Keep_C
D2’s resources are Valid: Keep_D (in Keep_C)
Invalid: Yank_D (in Yank_C)
B3’s resources are all in Yank_A
C3’s resources are all in Yank_B
D3’s resources are all in Yank_C
Behavior in current algorithm …

• The correction spreads downward
• Eventually, all certs with resources in “Keep” are repaired
  – A, B2, C2, and D2 now have reduced resources
  – Certs for B3, C3, D3 containing Yank_* resources are all invalid and will remain so
• At the end state, all resources in Yank from A down are no longer certified