

RT Change after the fiber-cuts

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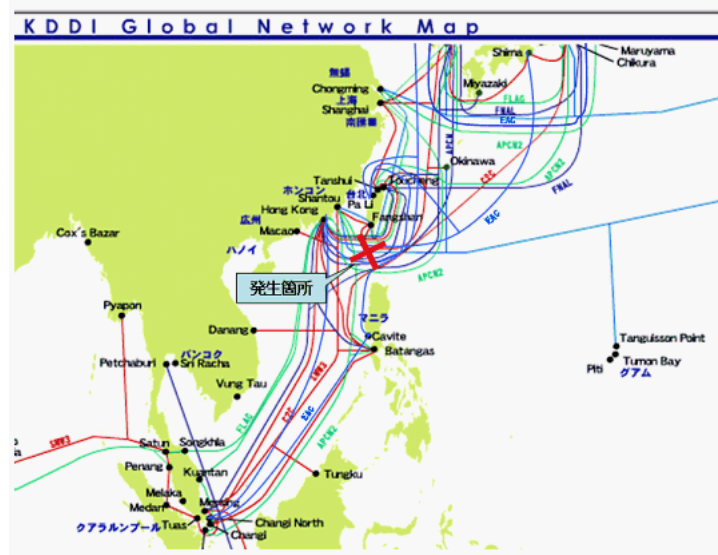
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What I have today

- ☆ **Work in progress**
 - Still incomplete
 - But maybe interesting at some degree
- ☆ **Just consider R&E path at this moment**
 - May need to compare general connectivity
 - How R&E networks were well connected
 - Were commercial ISPs better?

Many Fiber Systems affected

☆ From KDDI press release



Many Fiber Systems affected

☆ Almost nobody knew:

- Most of the fibers run the similar region
- Most of them could be affected by a single event
- Fiber cut occurred a few hours AFTER the earthquake

Methodology (1)

☆ Define APAN AS Set

- AU/ID/HK/JP/MY/KR/SG/TH/TW/VN
- U-of-Hawaii/TransPAC2
- TEIN2-North/South/Japan

☆ Take MRT format routing table dumps

- From RouteView Project, Oregon node
- <http://archive.routeviews.org/>

☆ Extract ASPATH portion between APAN AS Set

- Ignore before and after APAN ASs
- 2515 7660 22388 11537 7610 7473
- 7660 22388 11537 7610

☆ Then extract neighbor AS pairs

- 7660 - 22388
- 22388 - 11537
- 11537 - 760

Methodology (2)

☆ AS pairs

- They "had" connectivity then

☆ Not listed AS pairs

- Probably the direct connectivity was down
- But may be just not selected
- BGP announces only selected routes

☆ Draw a graph of difference in two BGP tables

- Black : link was usable in both timing
- Red : link went down
- Green : link came back
- Yellow : down or not selected

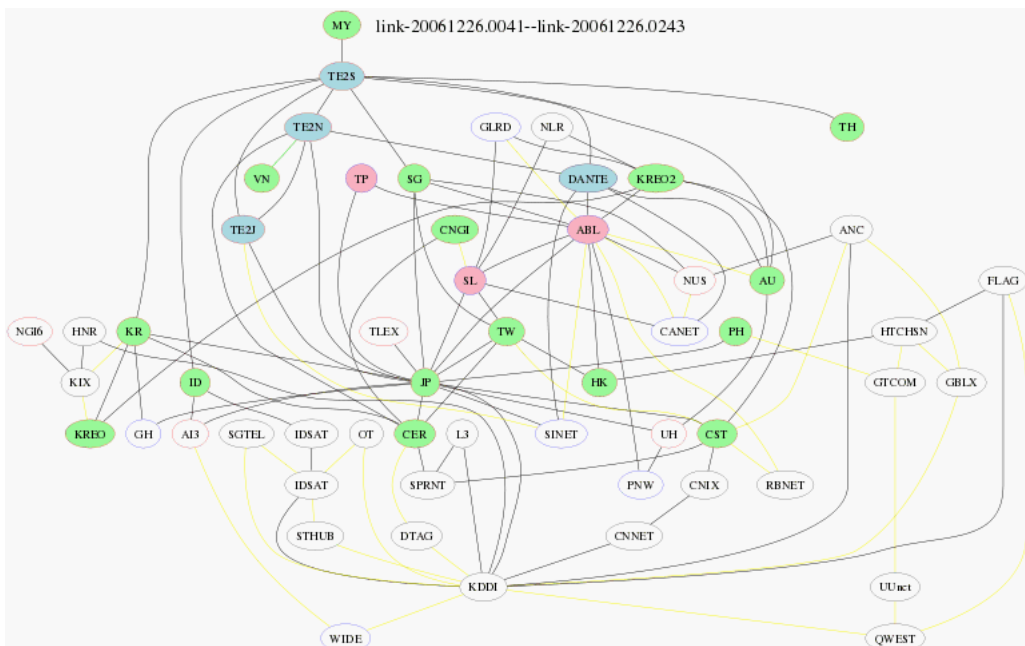
☆ Note:

- Graph connectivity doesn't mean the path was usable
- Just represents an AS pair
- The route may not always be announced/accepted

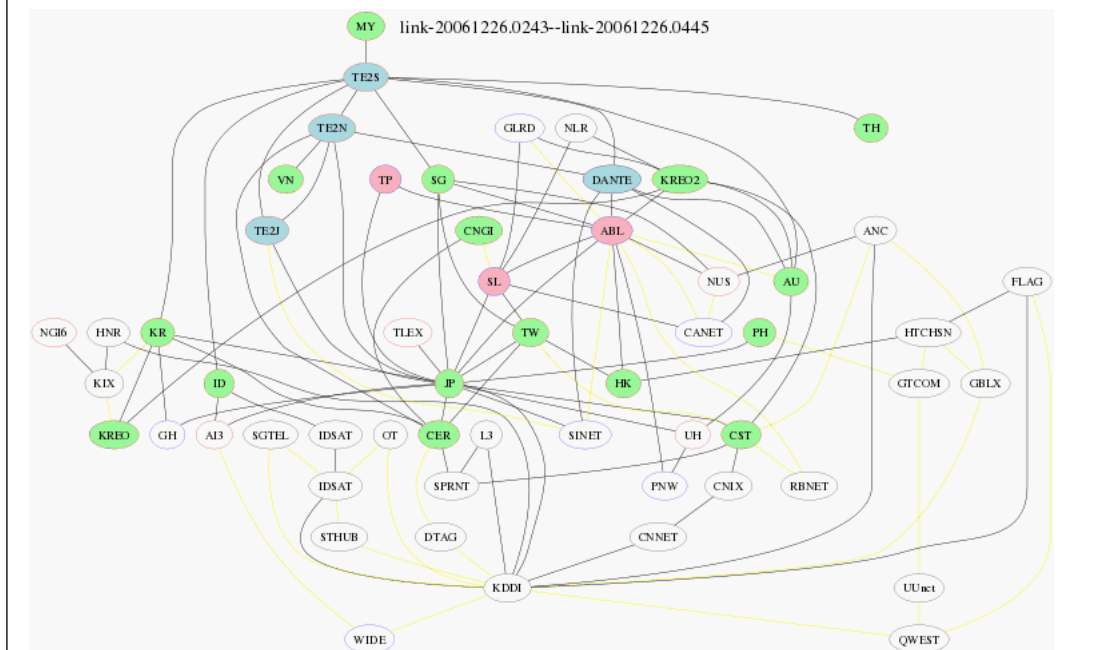
Snapshots

- ☆ Taiwan earthquake : at 1230UTC, Dec 26th
- ☆ All dumps until 0103UTC, Dec 27th
 - every 2 hours
- ☆ After it, take once a day at around 1200 UTC
 - until Jan 11

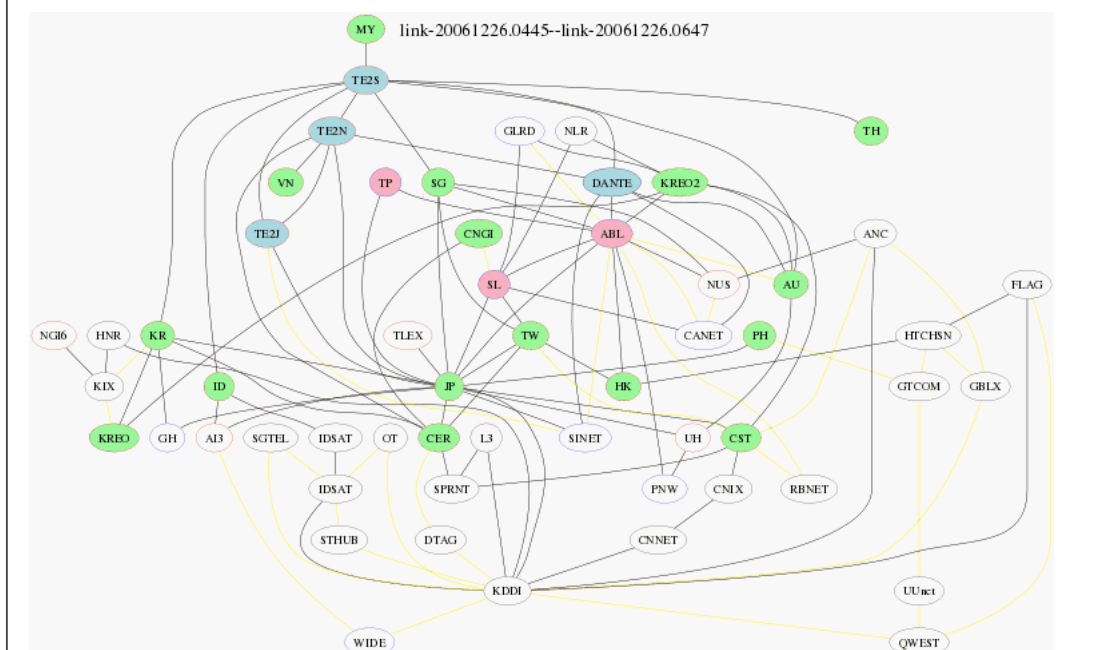
Dec 26 0041-0243



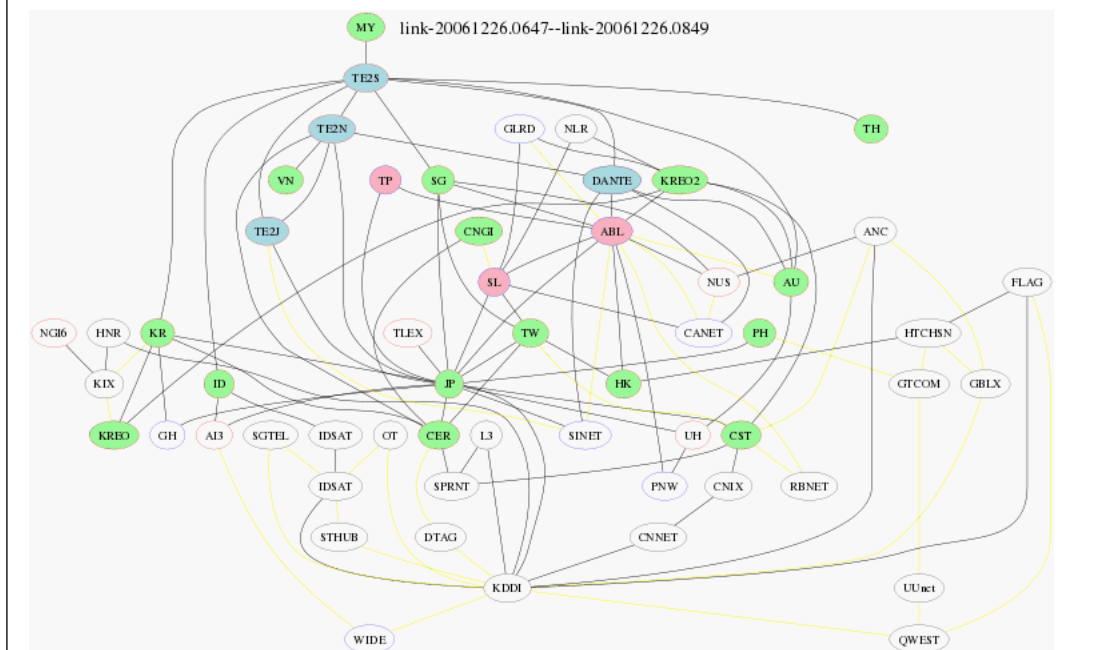
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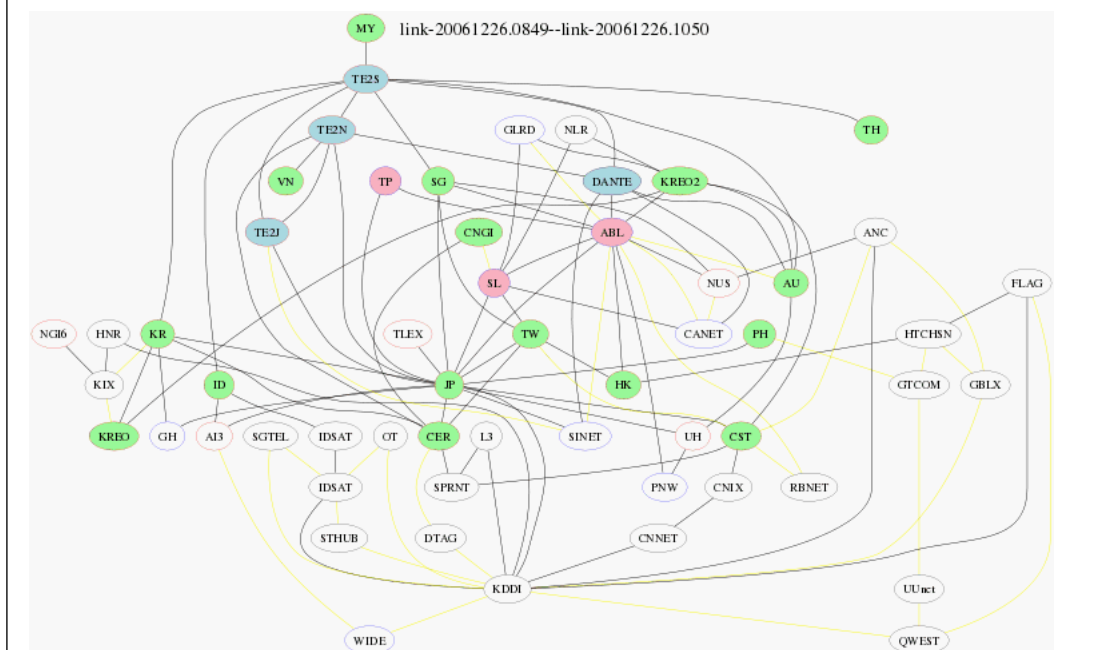
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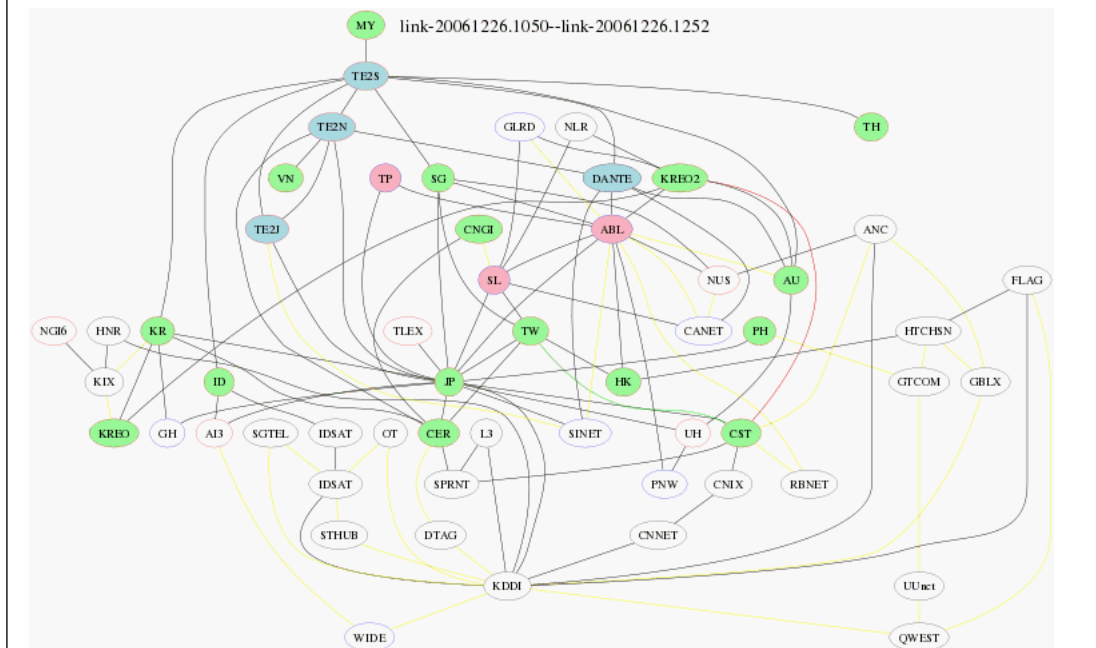
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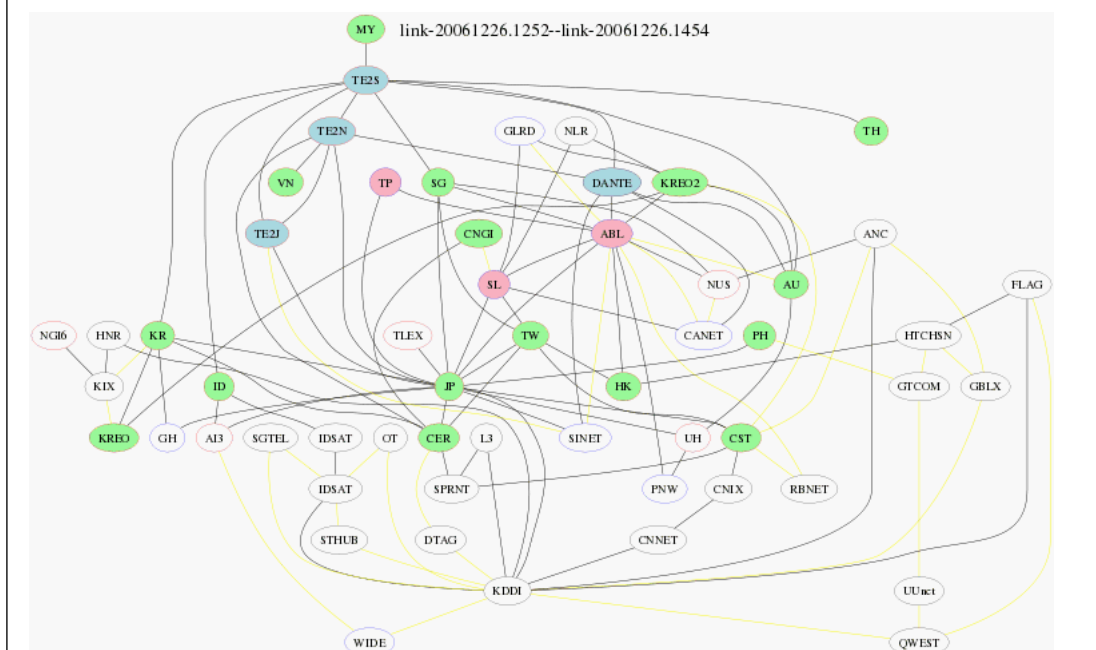
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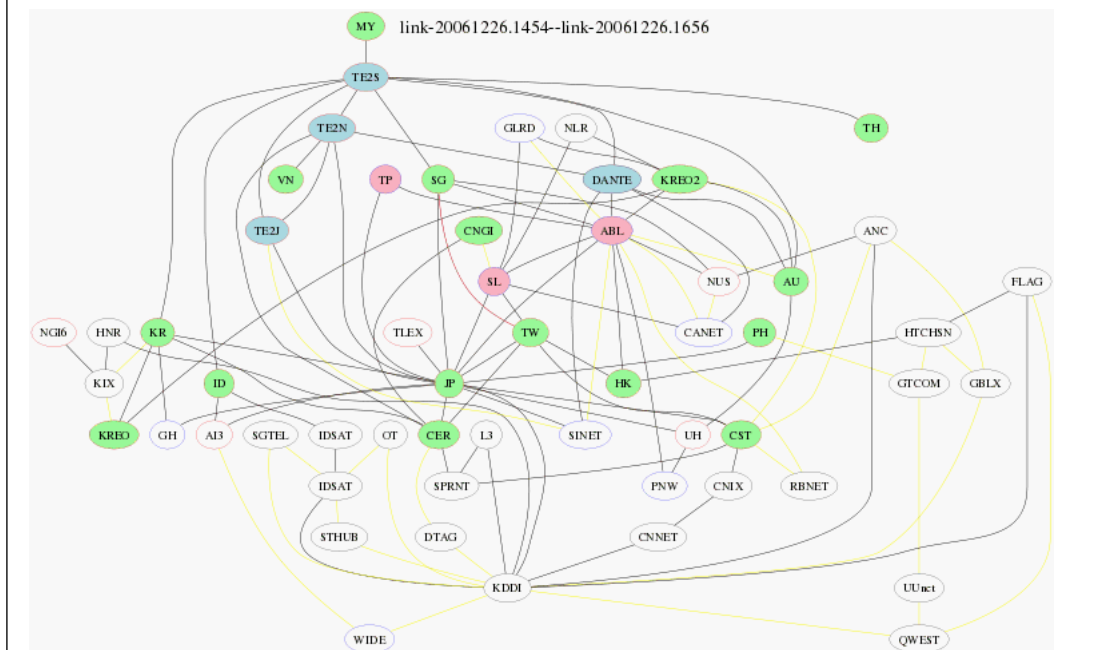
Dec 26 1050-1252 : it occurred



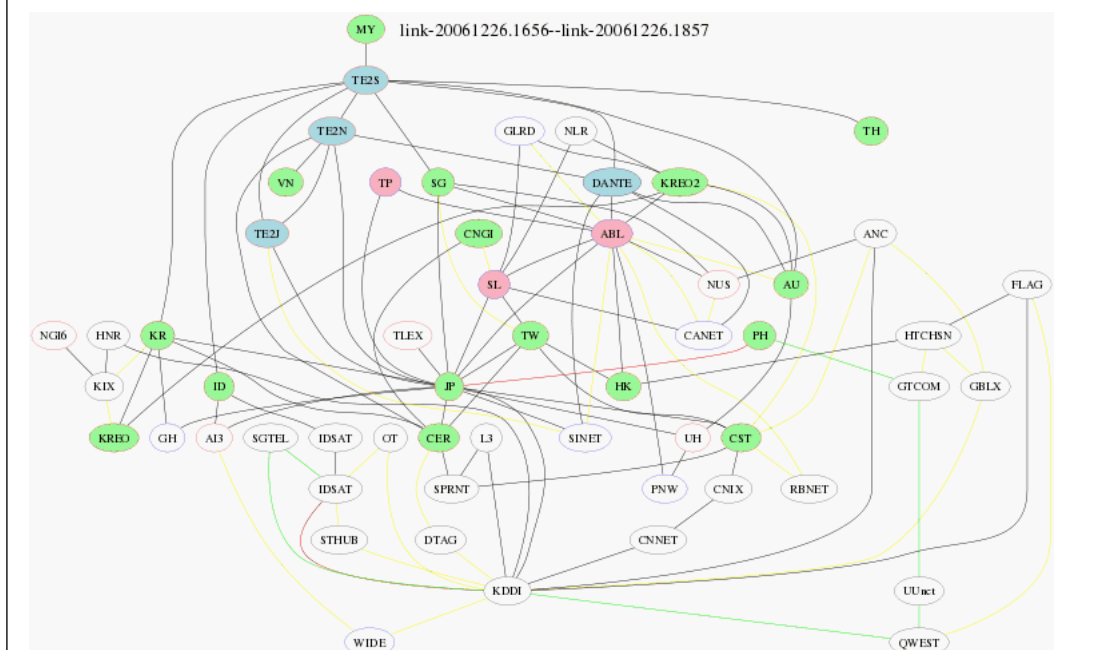
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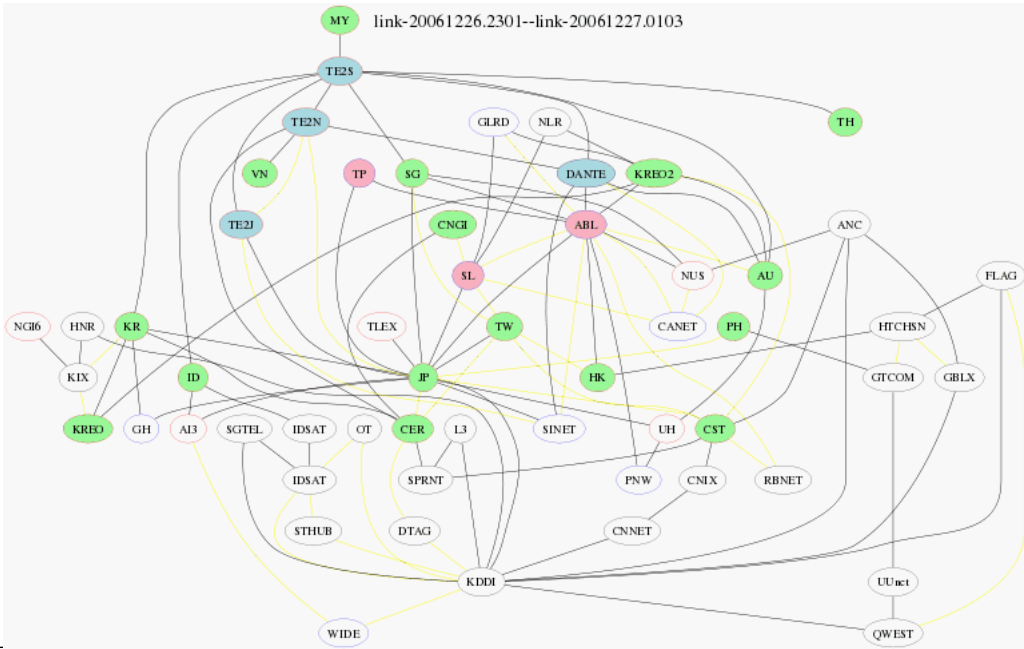
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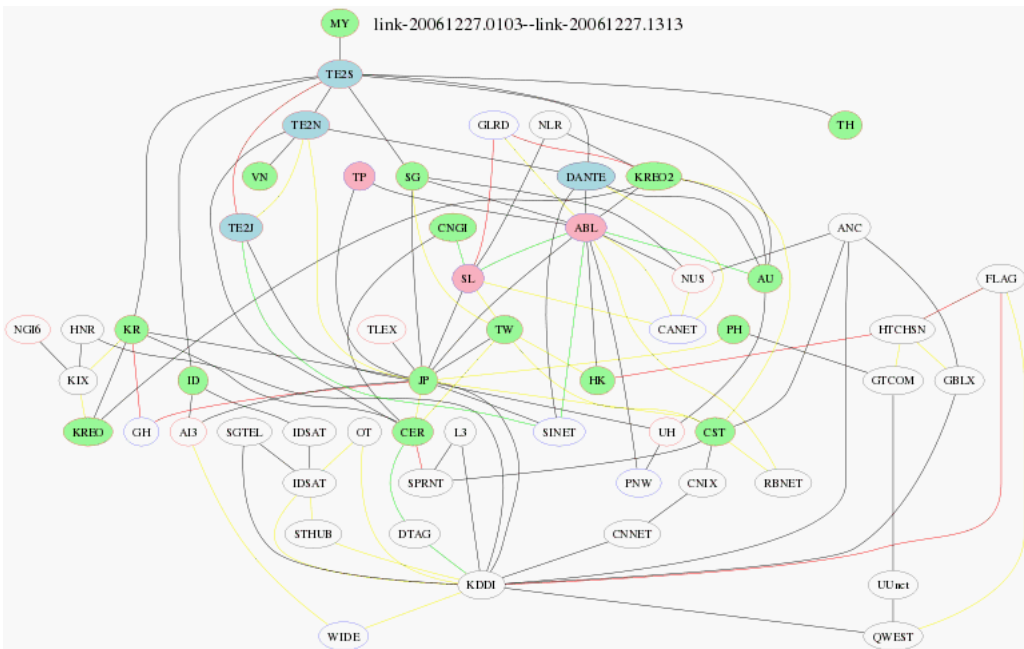
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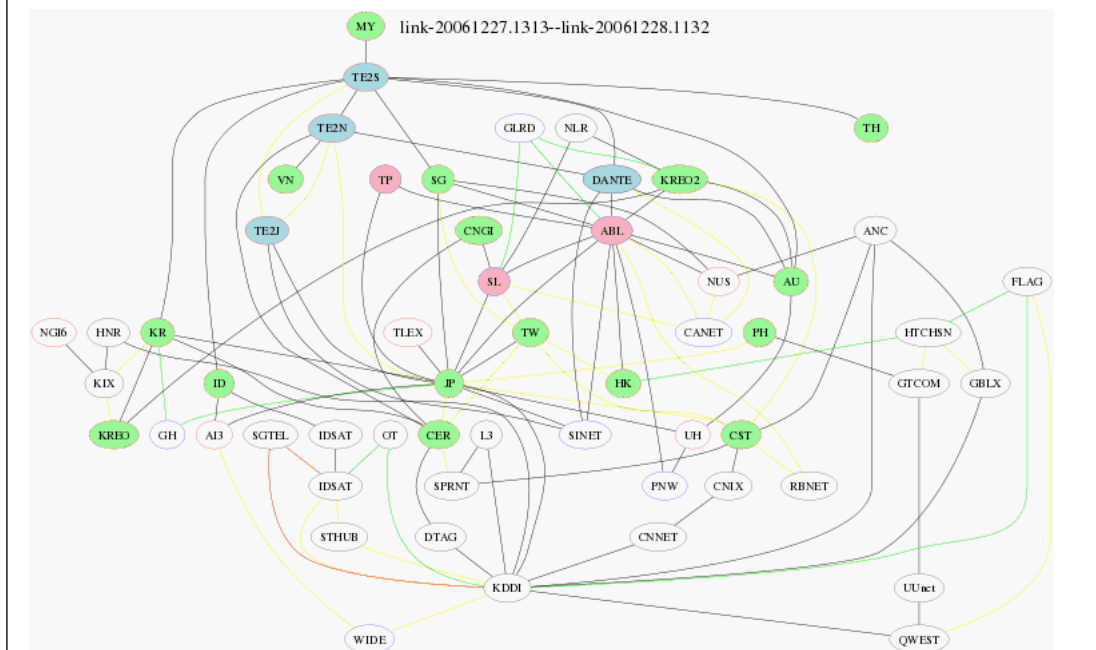
Dec 26 2301-Dec 27 0103



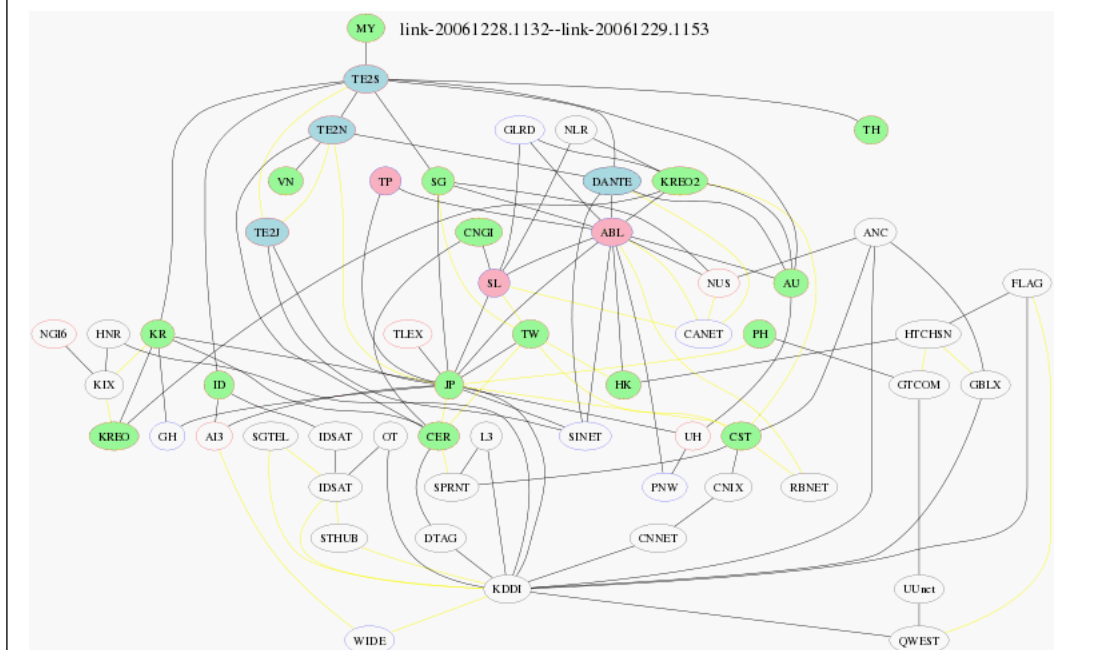
Dec 27 0103-Dec 27 1313



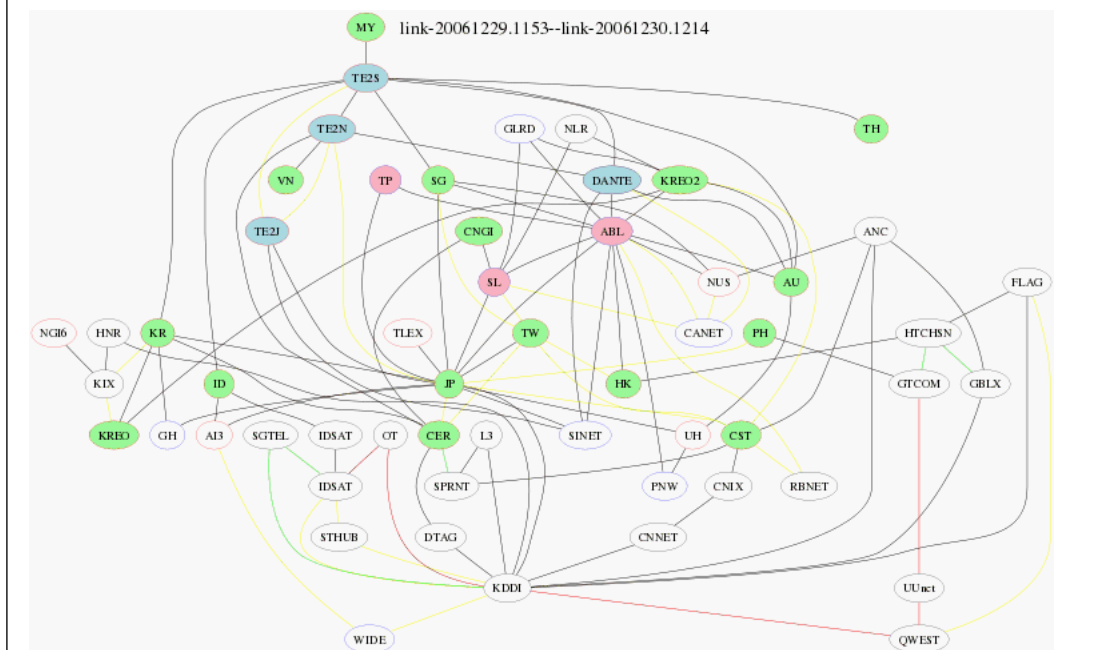
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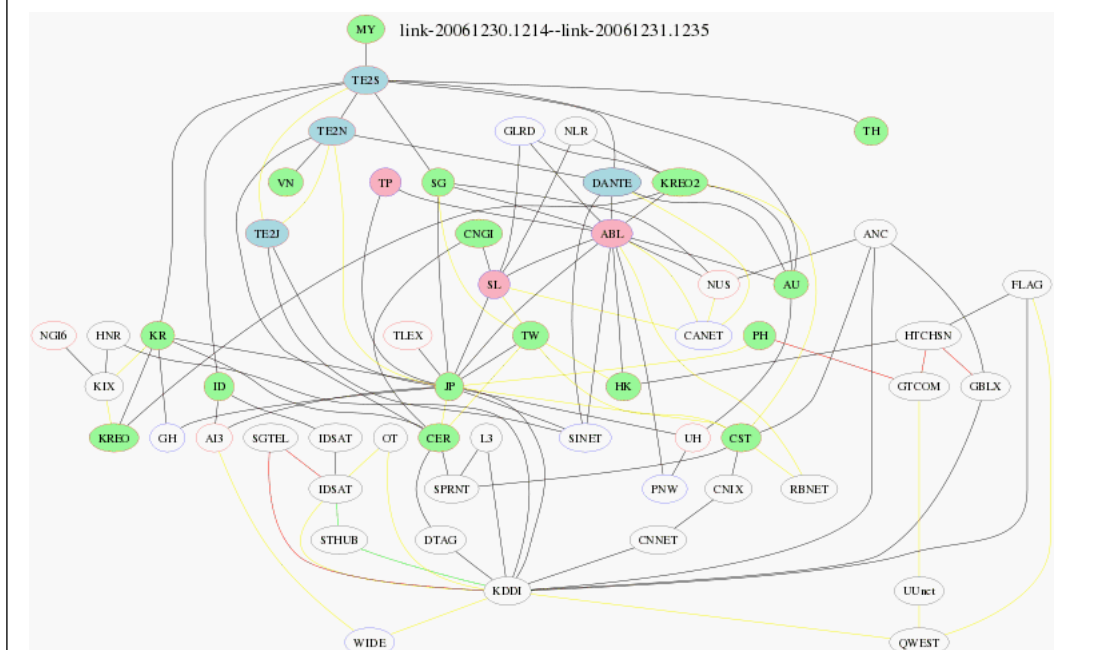
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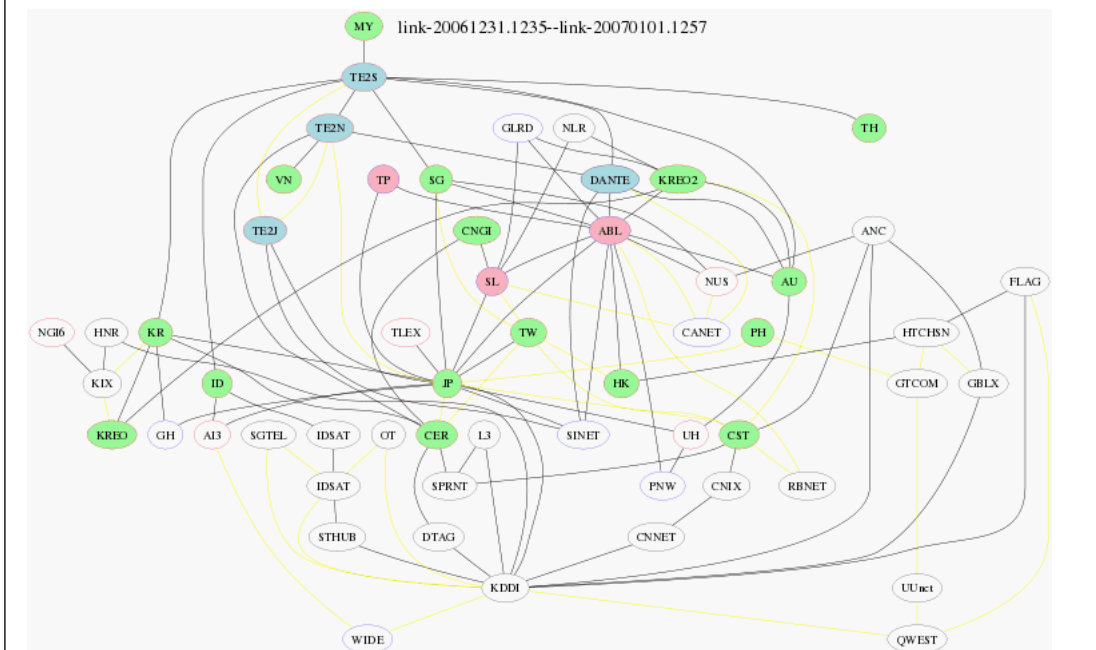
Dec 29 1153-Dec 30 1214



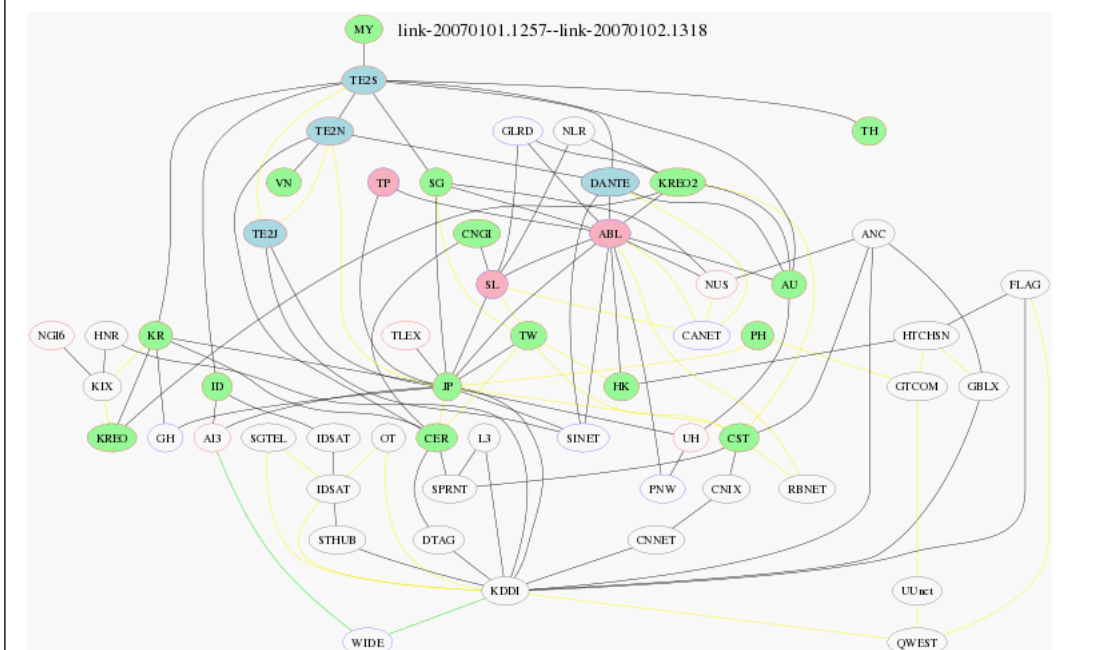
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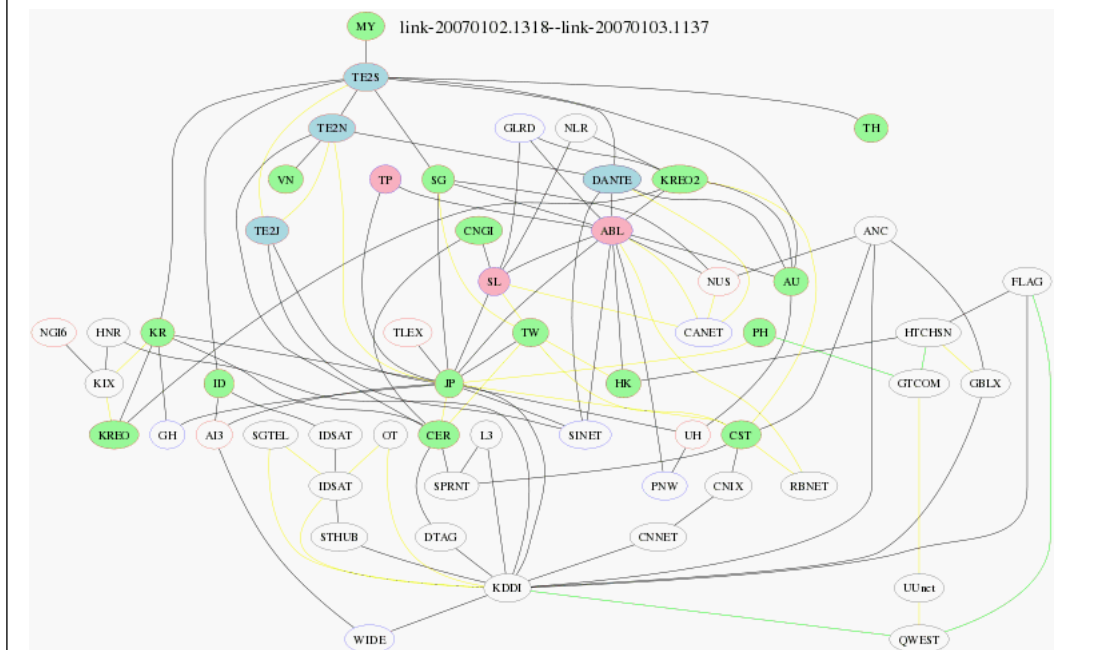
Dec 31 1235-Jan 1 1257



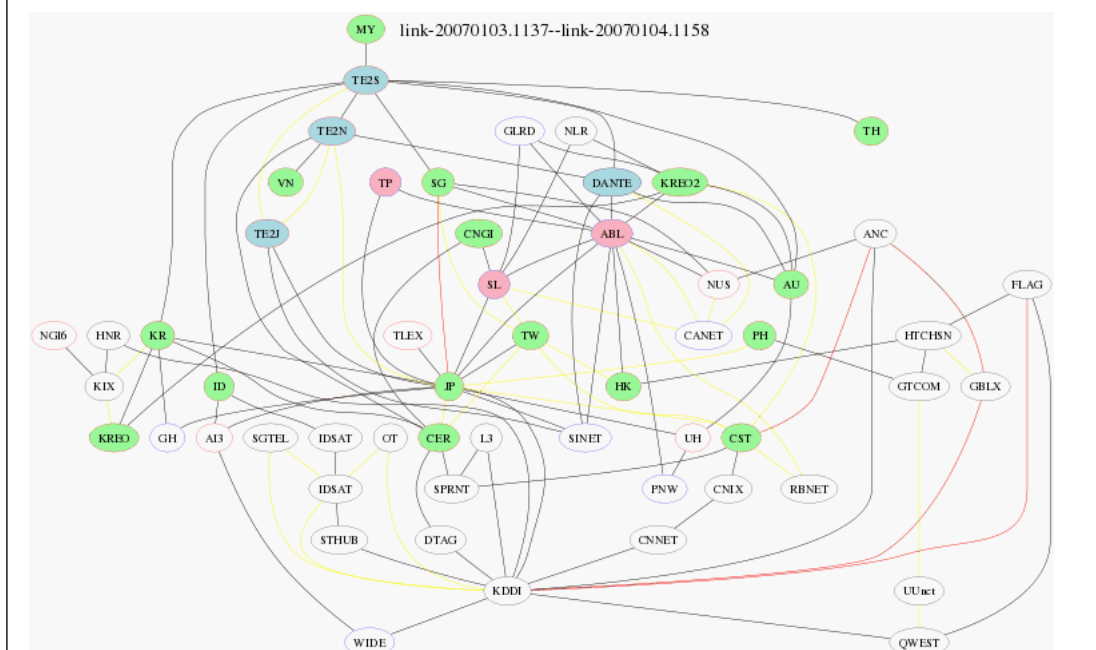
Jan 1 1257-Jan 2 1318



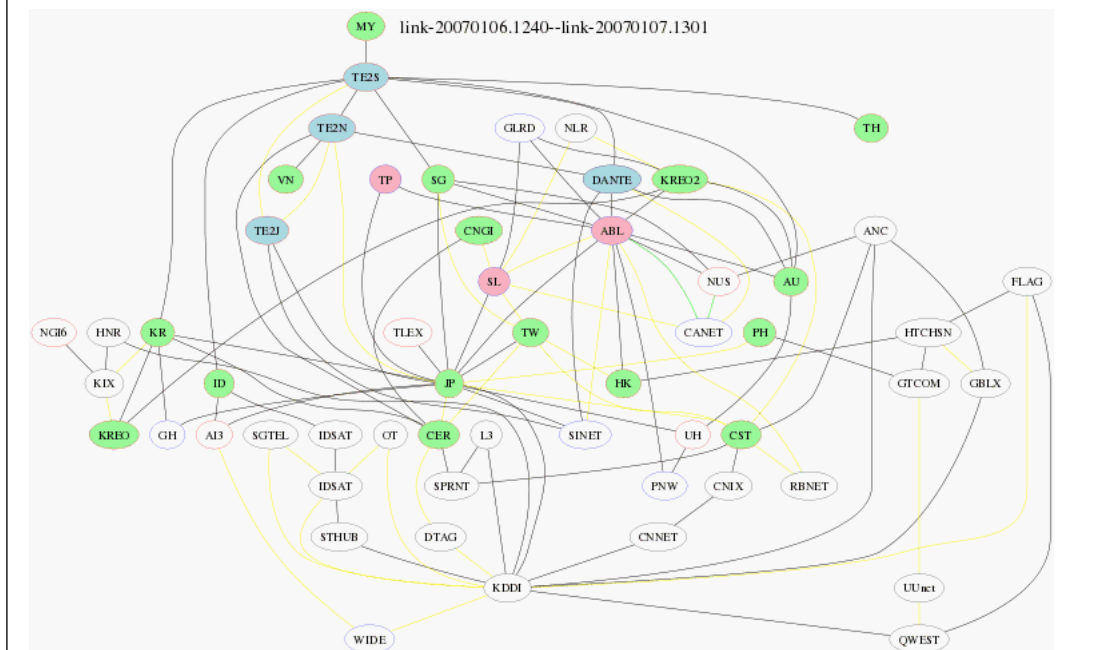
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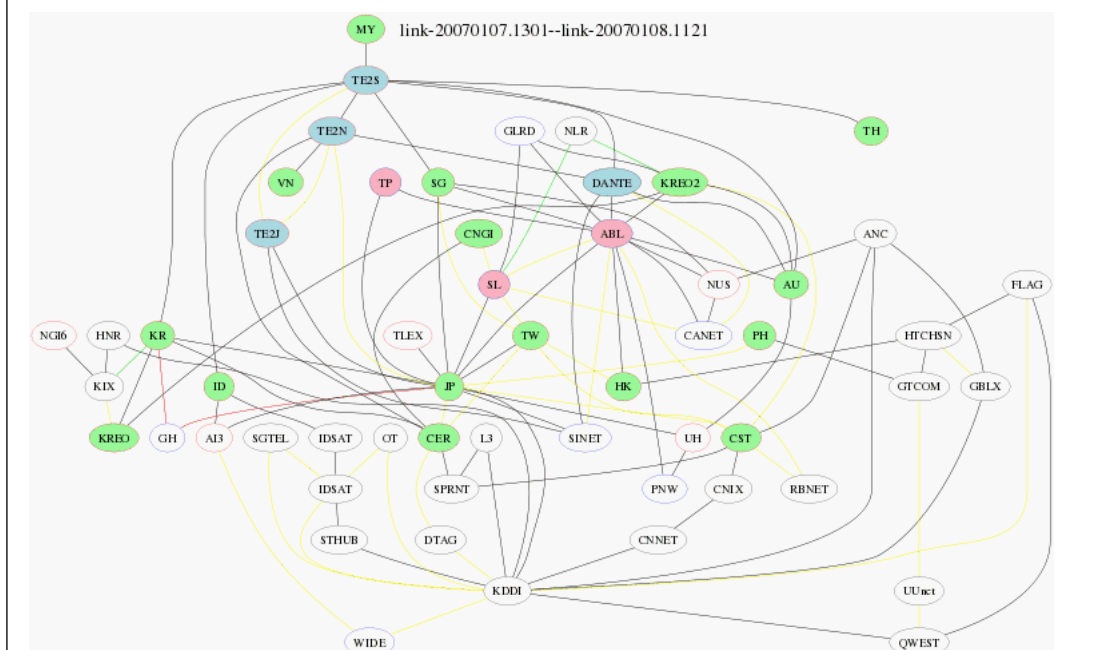
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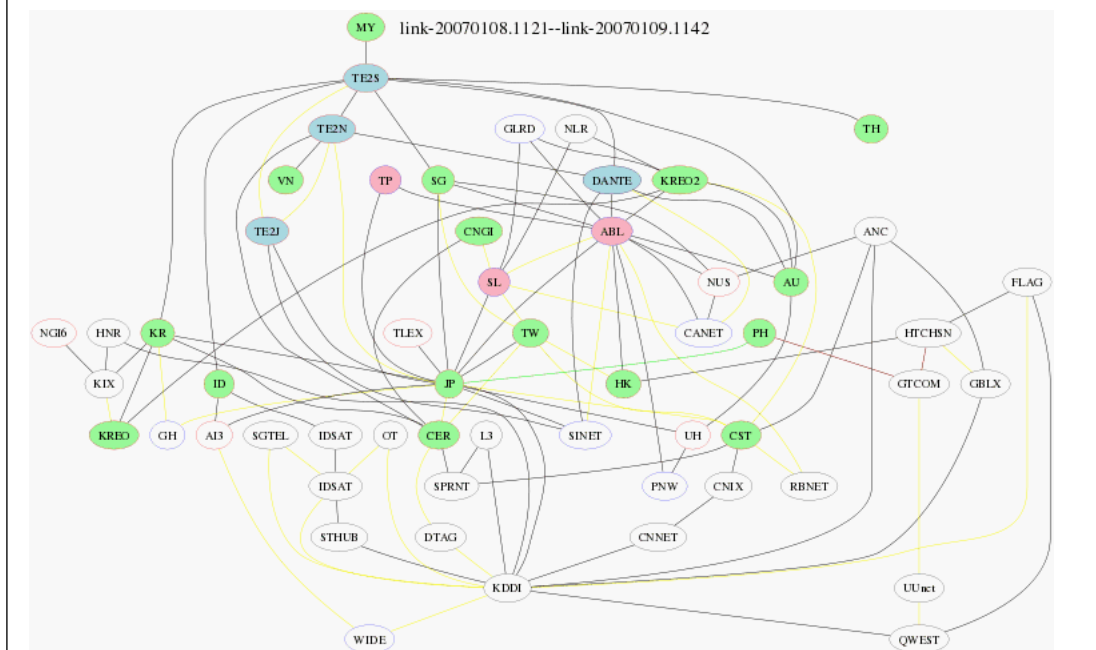
Jan 6 1240-Jan 7 1301



Jan 7 1301-Jan 8 1121



Jan 8 1121-Jan 9 1142



Jan 9 1142-Jan 10 1203

