JARINGAN KERJA PROYEK
Project Network

- Tool used for planning, scheduling, and monitoring project progress
- Developed from WBS
- Graphic flowchart of the project job plan
- Depicts the project activities, the interdependencies of activities that must be completed, start time and finish of activities and critical path
Rollup of Network Plans

Level 1 - Milestone Plan

Level 2 - Plans

Level 3 - Plans
Constructing a Project Network

- **Two Approaches:**
  - Activity on Node
  - Activity on Arch

- **Basic rules:**
  - Network flows typically from the left to right
  - An activity cannot begin until all preceding connected activities have been completed
  - Arrows on network indicate precedence and flow. Arrows can cross over each other
  - Each activity should have a unique identification number
  - An activity identification number must be larger than that of activities that precede it
  - Looping is not allowed
  - Conditional statements is not allowed
  - Experience suggest that when there are multiple starts, a common start node can be used to indicate a clear project beginning on the network. Similarly, a single project end node can be used to indicate a clear ending.
Activity on Arch

Menggambarkan kejadian/event

Menggambarkan Aktivitas
Contoh 1

<table>
<thead>
<tr>
<th>Aktivitas</th>
<th>Aktivitas yang Mendahului</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>-</td>
</tr>
<tr>
<td>B</td>
<td>A</td>
</tr>
<tr>
<td>C</td>
<td>B</td>
</tr>
<tr>
<td>D</td>
<td></td>
</tr>
</tbody>
</table>
## Contoh 2

<table>
<thead>
<tr>
<th>Aktivitas</th>
<th>Aktivitas yang mendahului</th>
<th>Aktivitas</th>
<th>Aktivitas yang mendahului</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>-</td>
<td>E</td>
<td>C, D</td>
</tr>
<tr>
<td>B</td>
<td>-</td>
<td>F</td>
<td>D</td>
</tr>
<tr>
<td>C</td>
<td>A</td>
<td>G</td>
<td>E</td>
</tr>
<tr>
<td>D</td>
<td>B</td>
<td>H</td>
<td>F</td>
</tr>
</tbody>
</table>
NETWORK

1. A
2. C
3. B
4. D
5. E
6. F
7. G

Dummy Activity
ANALISA LINTASAN KRITIS
Tujuannya adalah menentukan:

- **ES**: Earliest activity start time
- **LS**: Latest activity start time
- **EF**: Earliest activity finish time
- **LF**: Latest activity finish time
- **S**: Activity slack time (LS - ES) atau (LF - EF)

\[
\begin{align*}
EF &= ES + t \\
LF &= LS + t \\
S &= LS - ES \\
\text{atau} \\
S &= LF - EF
\end{align*}
\]
Perhitungan Maju & Mundur
Activity-on-Node Network Fundamentals

(A) A is preceded by nothing
    B is preceded by A
    C is preceded by B

(B) X
   Y
   Z
   Y and Z are preceded by X
   Y and Z can begin at the same time, if you wish

(C) J
    K
    M
    J, K, & L can all begin at the same time, if you wish
    (they need not occur simultaneously)
    but
    All (J, K, L) must be completed before M can begin

(D) X
    Z
    Z is preceded by X and Y

X
    Y
    AA
    AA is preceded by X and Y
## Example

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Preceding Activity</th>
<th>Activity Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Application approval</td>
<td>None</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>Construction plan</td>
<td>A</td>
<td>15</td>
</tr>
<tr>
<td>C</td>
<td>Traffic study</td>
<td>A</td>
<td>10</td>
</tr>
<tr>
<td>D</td>
<td>Service availability check</td>
<td>A</td>
<td>5</td>
</tr>
<tr>
<td>E</td>
<td>Staff report</td>
<td>B, C</td>
<td>15</td>
</tr>
<tr>
<td>F</td>
<td>Commission approval</td>
<td>B, C, D</td>
<td>10</td>
</tr>
<tr>
<td>G</td>
<td>Wait for construction</td>
<td>F</td>
<td>170</td>
</tr>
<tr>
<td>H</td>
<td>Occupancy</td>
<td>E, G</td>
<td>35</td>
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</tbody>
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Activity-on-Node Network Fundamentals

KOLL BUSINESS CENTER
County Engineers Design Department