Topic : High bandwidth on `Time-series` forecast modeling.

↳ ใช้ bandwidth ที่ส่งผ่านในแต่ละช่วงเวลาใน SNMP โดยใช้ Arima

`เพื่อ จัดแบ่ง + การจราจร path ในขับ packet`

↳ เป้าหมาย : model the network bandwidth → support. → data-flow mining parameter decisions nw topology link-planing.

} best nw performance.

modeling
① short-term (min) w/ ARMA [1 sec time-scale]
② mid-term (day) w/ ARCH [15 mins time-scale]
③ long-term (year) w/ ARIMA [1 week time-scale]

(หลาย mid-term [30-sec time scale] } ต้องขับรับ
↳ forecast point ✓

ในหน่วย `error` หมายถึง `standard deviation` (S.D.)

• Bandwidth utilization = การจราจรของ `router` (source) (page 2 แนะนำกลไก !)
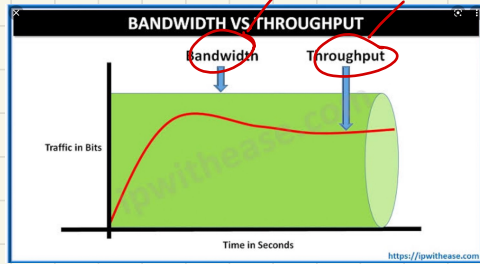
• Process of this model.

① measurement data (SNMP)
↓ decomposed by STL
② time series (season, trend, remainder)
③ ↓ Arima model
↓
④ reduce computation time.

Related work considers
• time-scale ในรูปแบบของการทำ `forecast error`
• throughput vs bandwidth

max-size   data at time.

BANDWIDTH VS THROUGHPUT
Bandwidth   Throughput
Traffic in Bits
Time in Seconds
https://ipwithease.com

each devices sending packet from time-time (การทำ แต่ ม่อในไทม in √(12))

• focus on the forecast of `available bandwidth by using passive measurements from routers estimation from probing packets
we not do that

model development
• Univariate time series model. - estimate a future value.
↳ observed (SNMP) data up to (time) — $(x_1, x_2, \ldots, x_n)$
Simple Network Management Protocol

Eqn $|e_n(h)| = (z_{n+h}) - (\hat{z}_n(h))$ - forecast of h steps ahead
↑ error.   available value

① remove seasonality in SNMP by STL.
② time series of seasonality, trend, remainder
③ Arima → reduce computation.
- bandwidth utilization → router to router