Values marked with * are determined empirically

| **Star topology** | | | | |
|---|---|---|---|---|
| *Parameters Br.V.* | Random | Random | *High degree* | *High degree* |
| *Bridges* | 1 | b | 1 | b |
| $\|V_e\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ |
| $\|E_e\|$ | $\sum_1^n \|E_{s_i}\| + (n-1)$ | $\sum_1^n \|E_{s_i}\| + (n-1) \times b$ | $\sum_1^n \|E_{s_i}\| + (n-1)$ | $\sum_1^n \|E_{s_i}\| + (n-1) \times b$ |
| *Components* | $n \times G_{s_i}$ | $n \times G_{s_i}$ | $n \times G_{s_i}$* | $n \times G_{s_i}$* |
| *Diameter* | $\sum_1^3 \max D(S_i) + 2$ | $\sum_1^3 \max D(S_i) + 2$ | $\sum_1^3 \max D(S_i) + 2$ | $\sum_1^3 \max D(S_i) + 2$ |
| *Avg. clustering* | Similar | Decreases* | Similar* | Decreases* |
| *Avg. shortest path* | $\approx 3 \times AvgP(S_i)$ | Decreases with b | $\approx 3 \times AvgP(S_i)$* | Decreases with b* |
| *Avg. degree* | Similar | Increases with b | Similar* | Increases with b* |
| *Density* | Decreases | Increases with b | Decreases | Increases with b |

**Table 1:** Quantifying the impact of different parameters choices for constructing $G_e$ using the *star* topology.

| **Chain topology** | | | | |
|---|---|---|---|---|
| *Parameters Br.V.* | Random | Random | High degree | High degree |
| *Bridges* | 1 | b | 1 | b |
| $\|V_e\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ |
| $\|E_e\|$ | $\sum_1^n \|E_{s_i}\| + (n-1)$ | $\sum_1^n \|E_{s_i}\| + (n-1) \times b$ | $\sum_1^n \|E_{s_i}\| + (n-1)$ | $\sum_1^n \|E_{s_i}\| + (n-1) \times b$ |
| *Components* | $n \times G_{s_i}$ | $n \times G_{s_i}$ | $n \times G_{s_i}$* | $n \times G_{s_i}$* |
| *Diameter* | $\sum_1^n \max D(S_i) + (n-1)$ | $\sum_1^n \max D(S_i) + (n-1)$ | $\sum_1^n \max D(S_i) + (n-1)$ | $\sum_1^n \max D(S_i) + (n-1)$ |
| *Avg. clustering* | Similar | Decreases* | Similar* | Decreases* |
| *Avg. shortest path* | $\approx (n-1) \times AvgP(S_i)$ | Decreases with b | $\approx (n-1) \times AvgP(S_i)$* | Decreases with b* |
| *Avg. degree* | Similar | Increases with b | Similar* | Increases with b* |
| *Density* | Decreases | Increases with b | Decreases | Increases with b |

**Table 2:** Quantifying the impact of different parameters choices for constructing $G_e$ using the *chain* topology.

| **Ring topology** | | | | |
|---|---|---|---|---|
| *Parameters Br. V.* | Random | Random | *High degree* | *High degree* |
| *Bridges* | 1 | b | 1 | b |
| $\|V_e\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ |
| $\|E_e\|$ | $\sum_1^n \|E_{s_i}\| + n$ | $\sum_1^n \|E_{s_i}\| + n \times b$ | $\sum_1^n \|E_{s_i}\| + n$ | $\sum_1^n \|E_{s_i}\| + n \times b$ |
| *Components* | $n \times G_{s_i}$ | $n \times G_{s_i}$ | $n \times G_{s_i}$* | $n \times G_{s_i}$* |
| *Diameter* | $\sum_1^n \max D(S_i) + n$ | $\sum_1^n \max D(S_i) + n$ | $\sum_1^n \max D(S_i) + n$ | $\sum_1^n \max D(S_i) + n$ |
| *Avg. clustering* | Similar | Decreases* | Similar* | Decreases* |
| *Avg. shortest path* | $\approx n \times AvgP(S_i)$ | Decreases with b | $\approx n \times AvgP(S_i)$* | Decreases with b* |
| *Avg. degree* | Similar | Increases with b | Similar* | Increases with b* |
| *Density* | Decreases | Increases with b | Decreases | Increases with b |

**Table 3:** Quantifying the impact of different parameters choices for constructing $G_e$ using the *ring* topology.

| **Fully connected topology** | | | | |
|---|---|---|---|---|
| *Parameters Br. V.* | Random | Random | High degree | High degree |
| *Bridges* | 1 | b | 1 | b |
| $\|V_e\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ | $\sum_1^n \|V_{s_i}\|$ |
| $\|E_e\|$ | $\sum_1^n \|E_{s_i}\| + (n-1) \times n$ | $\sum_1^n \|E_{s_i}\| + ((n-1) \times n) \times b$ | $\sum_1^n \|E_{s_i}\| + (n-1) \times n$ | $\sum_1^n \|E_{s_i}\| + ((n-1) \times n) \times b$ |
| *Components* | $n \times G_{s_i}$ | $n \times G_{s_i}$ | $n \times G_{s_i}$* | $n \times G_{s_i}$* |
| *Diameter* | $\sum_1^2 \max D(S_i) + 1$ | $\sum_1^2 \max D(S_i) + 1$ | $\sum_1^2 \max D(S_i) + 1$ | $\sum_1^2 \max D(S_i) + 1$ |
| *Avg. clustering* | Similar | Decreases* | Similar* | Decreases* |
| *Avg. shortest path* | $\approx 2 \times AvgP(S_i)$ | Decreases with b | $\approx 2 \times AvgP(S_i)$* | Decreases with b* |
| *Avg. degree* | Similar | Increases with b | Similar* | Increases with b* |
| *Density* | Decreases | Increases with b | Decreases | Increases with b |

**Table 4:** Quantifying the impact of different parameters choices for constructing $G_e$ using the *fully connected* topology.