In [1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
```

In [2]:
```
df = pd.read_csv('Comcast_telecom_complaints_data.csv')
```

In [3]:
```
df.head()
```

Out[3]:

	Ticket #	Customer Complaint	Date	Date_month_year	Time	Received Via	City	State	Zip code	Status	Filing on Behalf of Someone
0	250635	Comcast Cable Internet Speeds	22-04-15	22-Apr-15	3:53:50 PM	Customer Care Call	Abingdon	Maryland	21009	Closed	No
1	223441	Payment disappear - service got disconnected	04-08-15	04-Aug-15	10:22:56 AM	Internet	Acworth	Georgia	30102	Closed	No
2	242732	Speed and Service	18-04-15	18-Apr-15	9:55:47 AM	Internet	Acworth	Georgia	30101	Closed	Yes
3	277946	Comcast Imposed a New Usage Cap of 300GB that ...	05-07-15	05-Jul-15	11:59:35 AM	Internet	Acworth	Georgia	30101	Open	Yes
4	307175	Comcast not working and no service to boot	26-05-15	26-May-15	1:25:26 PM	Internet	Acworth	Georgia	30101	Solved	No

In [4]:
```
df.info()
```

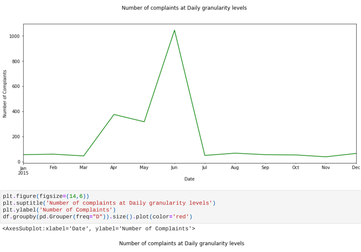
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2224 entries, 0 to 2223
Data columns (total 11 columns):
 #   Column                      Non-Null Count  Dtype 
---  ------                      --------------  ----- 
 0   Ticket #                    2224 non-null   object
 1   Customer Complaint          2224 non-null   object
 2   Date                        2224 non-null   object
 3   Date_month_year             2224 non-null   object
 4   Time                        2224 non-null   object
 5   Received Via                2224 non-null   object
 6   City                        2224 non-null   object
 7   State                       2224 non-null   object
 8   Zip code                    2224 non-null   int64 
 9   Status                      2224 non-null   object
 10  Filing on Behalf of Someone 2224 non-null   object
dtypes: int64(1), object(10)
memory usage: 191.2+ KB
```

In [5]:
```
df['Date'] = pd.to_datetime(df['Date'], format= '%d-%m-%y')
```

In [6]:
```
df = df.drop('Date_month_year', axis= 1)
```

In [7]:
```
plt.figure(figsize=(14,6))
df['Date'].value_counts().plot()
```

Out[7]:
```
<AxesSubplot:>
```

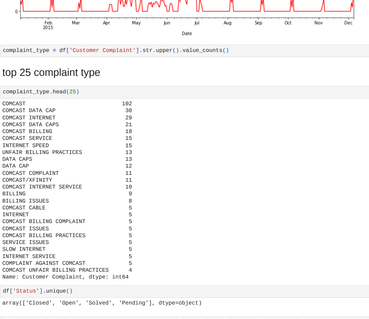


In [8]:
```
import datetime
```

In [9]:
```
df = df.set_index(df['Date'])
```

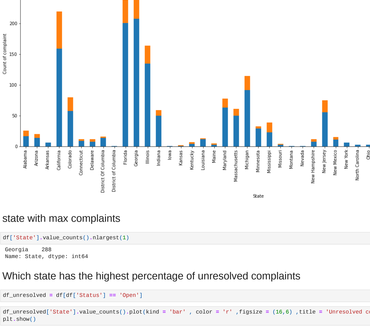
In [10]:
```
plt.figure(figsize=(14,6))
plt.suptitle('Number of complaints at Daily granularity levels')
plt.ylabel('Number of Complaints')
df.groupby(pd.Grouper(freq='M')).size().plot(color='g')
```

Out[10]:
```
<AxesSubplot:xlabel='Date', ylabel='Number of Complaints'>
```



In [11]:
```
plt.figure(figsize=(14,6))
plt.suptitle('Number of complaints at Daily granularity levels')
plt.ylabel('Number of Complaints')
df.groupby(pd.Grouper(freq="D")).size().plot(color='red')
```

Out[11]:
```
<AxesSubplot:xlabel='Date', ylabel='Number of Complaints'>
```



In [12]:
```
complaint_type = df['Customer Complaint'].str.upper().value_counts()
```

top 25 complaint type

In [13]:
```
complaint_type.head(25)
```

Out[13]:
```
COMCAST                          102
COMCAST DATA CAP                  30
COMCAST INTERNET                  29
COMCAST DATA CAPS                 21
COMCAST BILLING                   18
COMCAST SERVICE                   15
INTERNET SPEED                    15
UNFAIR BILLING PRACTICES          13
DATA CAPS                         13
DATA CAP                          12
COMCAST COMPLAINT                 11
COMCAST/XFINITY                   11
COMCAST INTERNET SERVICE          10
BILLING                            9
BILLING ISSUES                     8
COMCAST CABLE                      5
INTERNET                           5
COMCAST BILLING COMPLAINT          5
COMCAST ISSUES                     5
COMCAST BILLING PRACTICES          5
SERVICE ISSUES                     5
SLOW INTERNET                      5
INTERNET SERVICE                   5
COMPLAINT AGAINST COMCAST          5
COMCAST UNFAIR BILLING PRACTICES   4
Name: Customer Complaint, dtype: int64
```

In [22]:
```
df['Status'].unique()
```

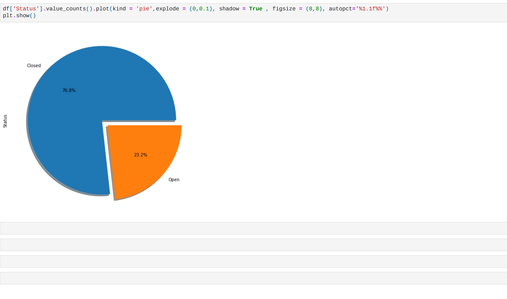
Out[22]:
```
array(['Closed', 'Open', 'Solved', 'Pending'], dtype=object)
```

In [51]:
```
df['Status'] =['Open' if i=='Open' or i== 'Pending' else 'Closed' for i in df['New_Status']]
```

In [53]:
```
df = df.drop('New_Status' ,axis=1)
```

Provide state wise status of complaints in a stacked bar chart

In [93]:
```
pd.crosstab(df['State'] , df['Status']).plot(kind = 'bar' , figsize =(20,8) , stacked = True , title = 'Statewise status of complains', ylabel = 'Count of complaint')
plt.show()
```



state with max complaints

In [112]:
```
df['State'].value_counts().nlargest(1)
```

Out[112]:
```
Georgia    288
Name: State, dtype: int64
```

Which state has the highest percentage of unresolved complaints

In [114]:
```
df_unresolved = df[df['Status'] == 'Open']
```

In [125]:
```
df_unresolved['State'].value_counts().plot(kind = 'bar' , color = 'r' ,figsize = (16,6) ,title = 'Unresolved complain statewise')
plt.show()
```


In [140]:
```
count_of_unresolved = df_unresolved['State'].value_counts()
```

In [141]:
```
percentagewise_open_complaints = count_of_unresolved/sum(count_of_unresolved)*100
```

In [146]:
```
percentagewise_open_complaints
```

Out[146]:
```
Georgia                 15.473888
California              11.798839
Tennessee                9.999999
Florida                  7.543520
Illinois                 5.699284
Michigan                 4.448743
Washington               4.448743
Texas                    4.255319
Colorado                 4.255319
Pennsylvania             3.868472
New Jersey               3.675048
Mississippi              3.094778
Maryland                 2.901354
Oregon                   2.514507
Massachusetts            2.127660
Virginia                 2.127660
Indiana                  1.740812
Alabama                  1.740812
Arizona                  1.160542
Utah                     1.160542
New Hampshire            0.773694
Delaware                 0.773694
Minnesota                0.773694
New Mexico               0.773694
Connecticut              0.580271
West Virginia            0.580271
South Carolina           0.580271
Kentucky                 0.580271
Maine                    0.386847
District Of Columbia     0.386847
Missouri                 0.193424
Vermont                  0.193424
Kansas                   0.193424
Louisiana                0.193424
Name: State, dtype: float64
```

76.8% percentage of complaints resolved till date

In [170]:
```
df['Status'].value_counts().plot(kind = 'pie',explode = (0,0.1), shadow = True , figsize = (8,8), autopct='%1.1f%%')
plt.show()
```


In [ ]:
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In [ ]:
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In [ ]:
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